

B-113

USEPA

DETREX CORPORATION

P.O. Box 5111, Southfield, MI 48086-5111
July 7, 1992

FAX: (313) 358-5803

TELEPHONE:
(313) 358-5800

Lawrence W. Eastep, P.E., Manager
Illinois Environmental Protection Agency
Permit Section
Division of Land Pollution Control
P.O. Box 19276
Springfield, IL 62794-9276

USEPA RECORDS CENTER REGION 5



1000085

RE: Detrex Corporation
Melrose Park, IL
ILD 074 424 938
RCRA Permit log No. B-113

Dear Mr. Eastep,

Enclosed is the original certification of the coating of the hazardous waste storage area at the Detrex facility located in Melrose Park, Illinois. As noted in your April 28, 1992 letter if Detrex does not respond with in 45 days of any deficiencies of the certification, then Detrex may consider the certification approved.

If we may be of additional assistance, please do not hesitate to contact me.

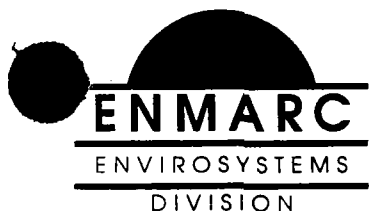
Sincerely,

William M. Moore, Jr.
William M. Moore, Jr.
Corporate Manager,
Environmental Compliance
RCRA Sections

cc: A. Dragovich (Letter only)
Facility

RECEIVED
JUL 30 1992
IEPA-DLPC

30



2000 DOMBEY ROAD • PORTAGE, INDIANA 46368
(219) 763-6226

June 29, 1992

*Mr. Ron Swan
Detrex Corporation
999 Haynes, Suite 305
Birmingham, MI 48008*

***RE: DETREX CORP., MELROSE PARK, ILLINOIS FACILITY
RCRA CONTAINER STORAGE AREA CERTIFICATION***

Dear Ron:

Enclosed is the Certification Statement prepared by ENMARC Envirosystems for purposes of demonstrating compliance with 35 IAC 724.265(b) with regard to the RCRA container storage operations located at the Detrex Corporation, Melrose Park, Illinois facility.

Please be aware that the certification statement (developed by the IEPA) will require signature by an authorized representative of the Detrex Corporation. I have marked this section on the original and copy provided. Please sign the original, and submit this along with three copies to the IEPA.

Should you have any further questions regarding the enclosed, or if ENMARC can provide Detrex with additional environmental services, feel free to contact me at your earliest convenience @ 708/257-9357.

Sincerely,

*Jeanette Virgilio
Environmental Engineer*



CERTIFICATION

This statement is to be completed by both the responsible officer and the registered professional engineer upon completion of construction in accordance with 35 IAC Section 702.126. Submit one copy of the certification with original signatures and two additional copies. Forward these certification statements and the information required to document construction to the following address:

Illinois Environmental Protection Agency
Division of Land Pollution Control -- #24
Permit Section
2200 Churchill Road
Post Office Box 19276
Springfield, Illinois 62794-9276

FACILITY NAME: Detrex Corporation, Melrose Park, Illinois

IEPA SITE CODE: LPC #0311860003

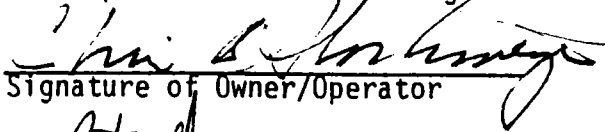
U.S. EPA ID NO.: ILD074424938

PART B PERMIT LOG #113

PERMIT (OR MODIFICATION) ISSUANCE DATE:

PERMIT CONDITION NO. REQUIRING CERTIFICATION:

The secondary containment area has been constructed in accordance with the specifications in the Part B and sealed in accordance with the specifications of the coating material approved in writing by the Agency on April 28, 1992. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.


Signature of Owner/Operator

Christopher B. Stockmeyer, President
Name and Title


Signature of Registered P.E.

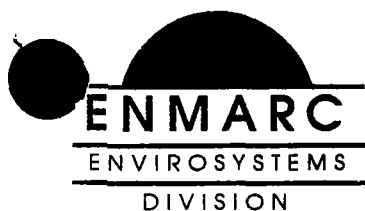
Peter Alvey, P.E.
Name of Registered P.E. and
Illinois Registered Number

6/23/92
Date

LWE:ALD:jk/1260r,86

(P.E. Seal)





2000 DOMBEY ROAD • PORTAGE, INDIANA 46368
(219) 763-6226

DETREX CORPORATION
Melrose Park, Illinois
ILD074424938

RCRA CONTAINER STORAGE FACILITY
Container Storage Requirements of 35 IAC 724.275(b)

Prepared by:

Jeanette Virgilio
Environmental Engineer
ENMARC Envirosystems
716 Hickory Street
Lemont, Illinois 60439

June, 1992

Detrex, Melrose Park, IL
ILD074424938
RCRA Container Storage Facility
35 IAC 724.275(b)

DETREX CORPORATION
Melrose Park, Illinois
ILD074424938

RCRA CONTAINER STORAGE FACILITY
Container Storage Requirements of 35 IAC 724.275(b)

EXECUTIVE SUMMARY

For purposes of meeting the requirements of 35 Illinois Administrative Code Section 724.254(b), "Containment", Detrex Corporation has installed a 6" x 6" concrete dike surrounding the container storage area and coated the entire concrete containment system (pad, dikes and ramps) with ICO Superguard brand epoxy coating manufactured by International Coatings, Inc. For purposes of reference a copy of the information presently incorporated into the facility's Part B Permit application, regarding the design and operation of the containment system, is attached at Appendix A.

An as-built survey of the area was completed by Detrex and is incorporated herein as Appendix B. The original design specifications for the coated concrete containment is incorporated under Appendix C. The only deviations from the original specifications was: the installation of a six (6) inch high curb instead of a 3 1/2 " curb; replacement of the existing ramps utilizing reinforced concrete; and use of 4500 psi concrete rather than the 4000 psi concrete.

The installation of the containment system coating was performed on May 5, 1992 and witnessed by ENMARC Envirosystems, Division of Leader Industries (2000 Dombey Road, Portage, Indiana). The coating systems was installed by Pate Construction (34717 Somerset, Westland, Michigan), certified contractor of International Coatings. Under Appendix D is a description of the installation procedures as provided by the installer. As indicated, Pate Construction applied the ICO Superguard coating (and appropriate primer and caulk) in accordance with the manufacturer's specifications. A copy of the manufacture's installation manual encompassing all of the ICO floor system installation procedures is incorporated at Appendix E.

EXECUTIVE SUMMARY - Cont'd

For purposes of quality assurance and quality control in the application of the ICO coating, an aggregate mixture is used (3/16") to ensure uniform and adequate thickness of the installed coating. Additional application control methods utilized by Pate Construction are described in Appendix D. No official test results of the QA/QC controls were recorded. If QA/QC procedures indicated an inadequate application thickness, the area was immediately re-sealed and rechecked at the time of installation.

Appendix F provides photographs of the container storage area, documenting the completion of the containment system construction activities. Additionally, the area was thoroughly inspected by an independent Illinois-registered professional engineer on 6-19 for evidence of cracks, gaps and visual observations of containment system defects. Appendix G provides a signed and certified statement by the engineer/inspector of the containment system's capacity to contain leaks or spills.

Detrex, Melrose Park, IL
ILD074424938
RCRA Container Storage Facility
35 IAC 724.275(b)

APPENDIX A

Part B Application Container Storage Containment Information
35 IAC 724.275

The following procedures are followed whenever Detrex is receiving and/or hauling hazardous wastes:

- 1) Detrex transports only properly manifested and labeled shipments that are accompanied with proper notification, if necessary, and meet the container condition requirements outlined in Section D-1a(1), of hazardous waste to its solvent recovery operation;
- 2) Only F001 and F002 wastes are accepted;
- 3) The manifest is signed and dated. One copy of the signed manifest is given immediately to the transporter, if other than Detrex, one copy is returned to the waste generator within 30 days, and one copy is retained at the facility for a period of at least 3 years;
- 4) Shipments are recorded in the Customer Hazardous Waste Shipment Ledger upon receipt at the facility;
- 5) A sample is taken from each container, per the waste analysis plan in Section C, for analysis;
- 6) Containers are stored in the properly designated, secured area. After analysis and the data is available, the waste material is shipped out for reclamation (recycling) at an off-site Detrex facility or to an off-site permitted treatment/disposal facility, as appropriate.

D-1a(3) Secondary Containment System Design and Operation [35 IAC 703.201(a)(1), 724.275(a) and (d)]

All containerized hazardous wastes are placed in the designated hazardous waste container storage area at the north end of the facility after being received on site. The container storage area is located within an enclosed building. The building floor, including the container storage area, is constructed of concrete.

A 6-inch concrete dike is provided, as shown in Attachment D-1, to provide adequate secondary containment for the hazardous waste container storage area within the north half of the warehouse area. Concrete access ramps are provided at two locations of this dike and at the two doorways on the north wall of the building to provide access for equipment (i.e. forklift) while maintaining secondary containment.

The concrete access ramps are at minimum 6 inches high.

D-1a(3)(a) Requirements for the Base or Liner
to Contain Liquids [35 IAC 724.275(a)(1)]

The building floor, including the container storage area, is constructed of concrete with a concrete dike to provide secondary containment in the container storage area. The concrete is coated with ICO-SUPERGUARD coating which provides an essentially impervious coating for the contained wastes as well as being compatible with each type of waste stored in the facility. There are no expansion or control joints in the floor slab and the surface is free of cracks and gaps. All doorways are diked with concrete ramps to maintain secondary containment while allowing for easy movement of equipment. The container storage area diking, and diked doorways are located on Attachment D-1. There are no floor drains or other such openings in the secondary containment area.

The sealant has been applied in accordance with the manufacturers instructions. The specifications of the selected sealant are provided in Attachment D-5.

This facility was originally constructed as an industrial building. Assuming a conservatively low design of a 5-inch thick, non-reinforced concrete floor slab for the facility, the modulus of rupture (M.R.) for such a slab is approximately 579 psi. The total factored wheel load based on conservatively high use and weight load of the existing forklift is 402.5 psi. This provides a factor of safety for the assumed concrete floor slab of 1.44. This indicates that at a minimum design standard, the existing floor slab is adequate. This fact is further illustrated since the slab has performed without structured problems for at least 15 years.

D-1a(3)(b) Containment System Drainage
[35 IAC 703.201(a)(2), 724.275(b)(2)]

The containers within the container storage area are placed on wooden pallets to elevate them off the concrete floor. Containers are also provided with adequate aisle space to allow for routine inspection. If an inspector discovers the presence of liquid, clean-up will be conducted. If necessary, the forklift can be used to move containers in order to complete the necessary clean-up.

D-1a(3)(c) Containment System Capacity
[35 IAC 703.201(a)(3), 724.275(b)(3)]

The very conservative estimate of the total capacity of the secondary containment system at the facility is approximately 8,221 gallons (Attachment D-3a provides the calculations, Attachment D-3b provides a facility drawing showing the dimensions and Attachment D-3c shows the arrangement of the containers within the container storage area). The maximum volume of containerized hazardous waste stored at the facility is 27,500 gallons (based on 500 drums at 55-gallons per drum).

Pursuant to the regulations [35 IAC 724.275(b)(3)], the containment system must have sufficient capacity to contain ten percent (10%) of the volume of containers or the volume of the largest container, whichever is greater. Thus, adequate containment is provided by the secondary containment system for the container storage area.

D-1a(3)(d) Control of Run-on [35 IAC 703.201(a)(4),
724.275(b)(4)]

Run-on into the containment system for the container storage area is eliminated by the building structure. All precipitation is controlled outside of the facility and drainage is promoted away from the building in all areas except the concrete driveway. In this area drainage is toward the facility, however, it is controlled via a catchbasin that discharges to the 18-inch diameter combined sewer on LeMoyne Avenue in front of the facility. The catchbasin is covered by an 18-inch round drainage lid. The catchbasin is provided with a standard sump below the invert of the direct discharge line to the LeMoyne Avenue sewer.

During unloading/loading operations within the truck dock (see Attachment D-1), care is taken to prevent contaminated liquid from discharging to the sewer system from the catchbasin in the event of a spill. During all container unloading/loading operations, a 4-foot x 4-foot square by 1/4-inch thick polypropylene pad is placed over the catchbasin and absorbent socking placed around it. The polypropylene pad and absorbent material prevents liquids from entering the catchbasin in the event of a spill. Additional absorbent material is also readily available to soak up any spilled liquids if required.

Date: 06/02/92
Revision: 92-2

ATTACHMENT D-3 SECONDARY CONTAINMENT SYSTEM CAPACITY

A) POSITIVE VOLUME

$$\begin{aligned}
 \text{Secondary Containment Area} &= 30'4" \times 76'6" + 29'4" \times 85'0" \\
 &= 4813.83 \text{ square feet} \times 6" \text{ high} \\
 &= 2,406.9 \text{ cubic feet} \\
 &= 18,005 \text{ gallons}
 \end{aligned}$$

B) NEGATIVE VOLUMES

$$\begin{array}{ll}
 \text{Drums on Floor} & \text{Product \& Empty} \\
 & = 300 \text{ drums (maximum)}
 \end{array}$$

$$\begin{aligned}
 \text{Volume per Drum} &= \pi \times r^2 \times h \\
 &= \pi \times (11")^2 \times 6" \text{ high} \\
 &= 2,280.8 \text{ cubic inches per drum} \\
 &= 9.87 \text{ gallons per drum} \\
 &= 2,961 \text{ gallons}
 \end{aligned}$$

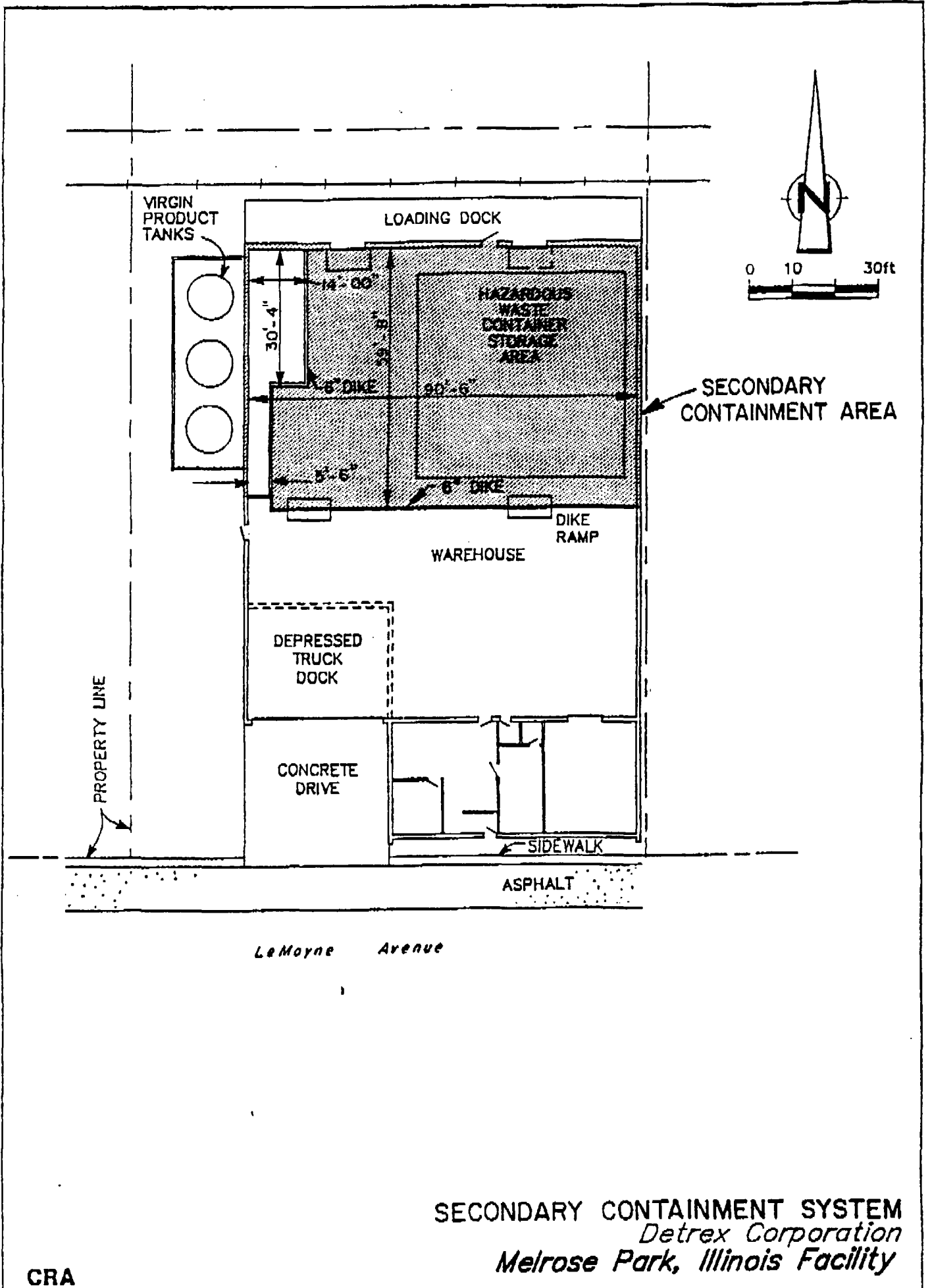
Hazardous Waste Drums
(assume entire area covered
by wooden pallets is a negative
volume)

$$\begin{aligned}
 \text{Volume per Pallet} &= 4' \times 4' \times 6" \text{ high} \\
 \text{(84 pallets maximum)} &= 8.0 \text{ cubic feet per pallet} \\
 &= 59.8 \text{ gallons per pallet} \\
 &= 5,023 \text{ gallons}
 \end{aligned}$$

$$\begin{aligned}
 \text{Miscellaneous Volumes} &= \text{assume 10\% of total volume} \\
 \text{(i.e. equipment, ramps)} &= 1,800 \text{ gallons}
 \end{aligned}$$

TOTAL SECONDARY CONTAINMENT CAPACITY = 8,221 gallons

Note: Assuming entire pallet as a negative volume is overly conservative.

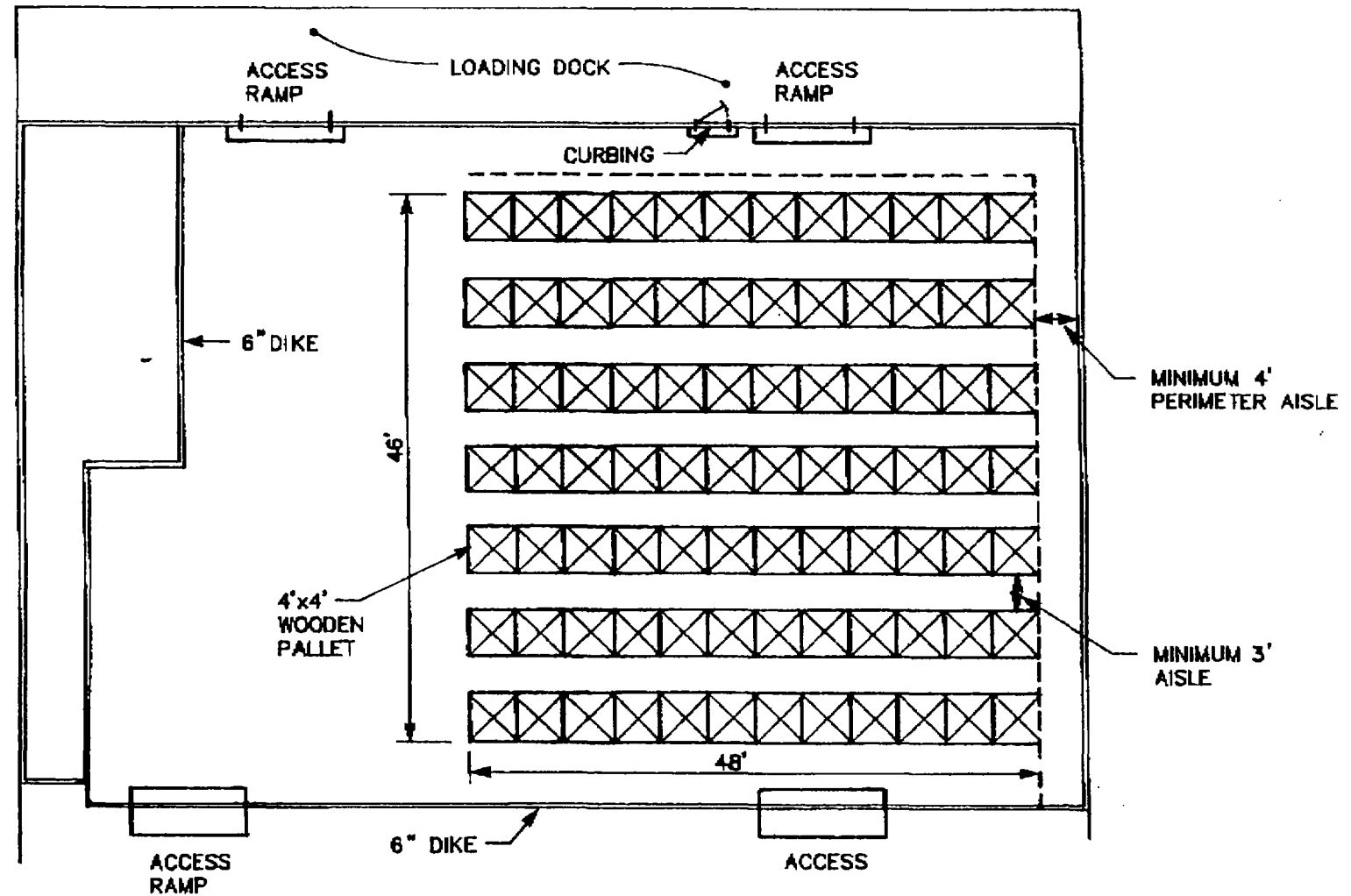


CRA

SECONDARY CONTAINMENT SYSTEM
Detrex Corporation
Melrose Park, Illinois Facility



SCALE: 1" = 15'



TYPICAL CONTAINER ARRANGEMENT
Detrex Corporation
Melrose Park, Illinois Facility

CRA

Detrex, Melrose Park, IL
ILD074424938
RCRA Container Storage Facility
35 IAC 724.275(b)

APPENDIX B

Container Storage Area Survey

Detrex, Melrose Park, IL
ILD074424938
RCRA Container Storage Facility
35 IAC 724.275(b)

APPENDIX C

Original Design Criteria for Containment System

**DETREX CORPORATION
MELROSE PARK, IL FACILITY
FLOOR COATING PROJECT**

Scope of Work

The Melrose Park facility is a permitted Treatment-Storage-Disposal facility which stores hazardous waste. In order to comply with new IEPA regulations, the Container Storage Area must have an impervious, chemical resistant coating applied. In addition to being impervious, the coating must withstand lift truck traffic and abuse from drum handling at the facility. The coating of choice for this project is International Coatings, Inc. Superguard brand epoxy coating. It will be applied to ¼" thickness in the storage area and on ramps with curbing to have a 30 mil application. All work shall be performed as per manufacturer's standards and owners specifications.

NOTE: Although other materials may be equivalent, the owner will not consider proposals substituting other materials.

Containment System Coating

Existing concrete shall be mechanically cleaned such that all foreign material is removed. Steel shot blasting or sand blasting are considered acceptable methods. All cracks, gaps, control and expansion joints shall be routed out in order to obtain a ½" wide by 1" deep gap suitable for installation of crack sealant. New concrete shall be acid etched with a 1 to 5 solution of 13° baume hydrochloric acid. Once clean and free from loose scale and/or paste, the new concrete shall be neutralized with a solution of soda ash and flushed clean with clear water.

All concrete shall be free of dust and water prior to the application of coating.

Existing concrete curbing shall have excess paste/form leakage removed from floor such that a sharp, clean edge is present. The edge shall be sealed with a ¼" bead of ICO Caulk X. Caulking material shall be allowed to cure prior to application of coating.

Cracks, gaps, expansion and control joints shall be sealed with ICO Patch and Aggregate mixture. The surface shall be troweled smooth and shall meet existing floor surfaces. ICO Patch shall be allowed to cure prior to installation of coating.

Concrete surfaces to be coated shall be primed with ICO Primer as per manufacturer's standards. Primer will be allowed to become tacky, but shall not be allowed to cure to dry, prior to application of coating. (If primer cures to dry prior to application of coating, dry area (s) shall be re-primed).

Concrete floor shall receive a ¼" troweled on application of ICO Superguard Coating. Coating shall be mixed with aggregate (from ICO) as per manufacturer's standards. Concrete curbs shall receive a 30 mil application of ICO Superguard Coating Only.

Required Concrete Curbing

Contractor to install new curb as shown in attachment. Curb to consist of 3½" x 3½" cross section and will be approximately 70 lineal feet long. Curb to be of 4000 psi concrete. Concrete to be

anchored to existing slab with $\frac{1}{2}$ " x 3" grade 8 anchor bolts. A continuous #4 bar shall be included and be covered by $1\frac{3}{4}$ " of concrete. Finished curb shall have edges cleaned to provide a sharp edge for sealant.

General

Contractor to comply with General Conditions as attached.

CONTRACT

<u>Description of Work Required</u>	<u>Price</u>	<u>Total</u>
1. Provide 70 lineal feet of $3\frac{1}{2}$ " x $3\frac{1}{2}$ " Curbing	\$ /L.F.	\$
2. Route & Seal 610 lineal feet of cracks	\$ /L.F.	\$
3. Install 5600 sq.ft. of $\frac{1}{4}$ " ICO Superguard Floor Coating	\$ /S.F.	\$
TOTAL CONTRACT		\$

ALTERNATES

1. Remove and replace four concrete ramps	\$ /ea	\$
2. Remove and replace 300 lineal feet of curbing	\$ /L.F.	\$
3. Increase 70 lineal feet of new curb dimensions to 6" x $5\frac{1}{2}$ "	\$ /L.F.	\$
TOTAL OF ALTERNATES		\$

**OPTIONAL CONCRETE WORK
MELROSE PARK FACILITY**

1. Remove existing ramps inside building (4). Sawcut through existing floor slab and remove. Install new ramps with 4,000 psi concrete. New ramps to be reinforced with #4 bars placed 12" on center. New ramp to be 5½" high, 7' long and 10' wide.
2. Remove existing curbing and install new curbing 6" wide, 5½" high. New curbing to be installed with ½" Grade 8 anchor bolts 18" on center and a #4 bar continuous in center of new curb. New curb to be installed with 4000 psi concrete.

NOTE: No chloride to be used in any concrete!

3. Increase dimensions of Required Concrete Curbing to 6" wide and 5½" high. Anchor and rebar heights to be raised accordingly.

Detrex, Melrose Park, IL
ILD074424938
RCRA Container Storage Facility
35 IAC 724.275(b)

APPENDIX D

Installers Description of Coating Application Procedures

PATE CONSTRUCTION
34717 Somerset
Westland, MI 48185
(313) 721-0774

Enmarc Envirosystems Division
2000 Dombey Road
Portage, IN 46368
Attn: Mr. Brock Reinhard

Dear Mr. Reinhard:

I am forwarding you the installation procedures used in the recent installation of an ICO 1/4" troweled on system applied at the request of Mr. Ronald Swan, Manager of Engineering.

Concrete Work:

All existing ramps and approximately 240 lineal feet of 3 1/2 x 3 1/2" concrete curbing were removed using standard percussion tools. A diamond blade was used to saw cut the leading edges of the new ramps. The concrete at the leading edge and for two feet back was removed down to the original fill. Holes at the leading edge of the concrete were drilled and #4 rebar was set into the holes such that a continuous bar was set from one edge to the other. Rebar was placed in this fashion 16" on center, each way. Additionally, grade 8 anchor bolts were set 16" on center in the middle of the ramp and a #4 bar tied to the anchors. The remaining curbing (approximately 300 L.F.) was formed, had anchor bolts installed 16" O/C and had #4 rebar tied to it.

The concrete curbs and ramps were poured monolithically on Saturday, May 9th. The concrete mixture utilized was 7 bag mix (>4,000 psi) and was vibrated to remove any air trapped at the forms. The concrete was allowed to cure for one week since it was basically high early strength.

Coating:

The cracks, control and expansion joints were routed out to 1/2" wide x 1" deep with a Windsor Model JAW-1A crack router. The floor slab was shot blasted with 230 shot utilizing a Wheelabrator 10" Blast Track machine. Areas which the machine could not get at were sandblasted with silica sand.

The cracks were then filled with ICO Patch using liquid to aggregate ratios as per the manufacturer's specifications. Areas in which the material seeped into the cracks were refilled. A 4" wide fiberglass mesh tape was then set over the cured ICO-Patch using ICO Superguard Primer. All joints where new concrete was placed on/at existing concrete were then caulked with ICO Caulk. The fiberglass tape/primer and

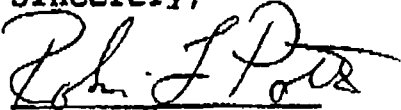
caulk were allowed 24Hrs. to cure prior to installation of
Enmarc EnviroSystems Division
Page 2

the ICO Superguard system.

ICO Superguard Primer was mixed and applied to the slab surface prior to the installation of the troweled on coating. (Coverage was approximately 750 S.F. per kit). The ICO Superguard coating was then mixed, according to manufacturer's specifications, and applied by our crew of ICO Certified Applicators. To insure proper application thickness a "spike punch" was used. This is essentially a punch with a flat "washer" at 1/4" from the point. If the washer touches the surface of the area being tested, a minimum of 1/4" is known to have been applied. Also as a second QA/QC check, we calculated where we should be at 1/4, 1/2, and 3/4's the way through the project and how much material should be used. Our original calculations indicated that we should use 11 kits per quarter. During the installation we actually used 12 kits per quarter. We then used the remaining four kits to apply 30 mils of ICO Superguard to the curbing and 60 mils to the ramps. On the ramps, we broadcast silica sand to provide a non-skid finish.

I'm confident that the information contained herein will meet your requirements. However, should you need any more information, please feel free to contact me.

Sincerely,


Robin L. Pate
President

cc. Mr. Ronald E. Swan, Jr. - Detrex

Detrex, Melrose Park, IL
ILD074424938
RCRA Container Storage Facility
35 IAC 724.275(b)

APPENDIX E

Manufacturer's Installation Manual

INTERNATIONAL COATINGS INC.

7052 Barry Street, Rosemont, Illinois 60018 • 708/824-6070 • 800/624-8919 • Fax 708/824-6088

March 17, 1992

TABLE OF CONTENTS

INSTALLATION PROCEDURES FOR ICO FLOOR SYSTEMS

1.0	CLEANING OF THE SUBSTRATE	<u>PAGE NO.</u>
1.1	Cleaning old concrete - Mechanical Abrading	1
1.2	Oil, Grease, Wax removal	1
1.3	Removal of coatings, sealers, old toppings, failing repairs	1
1.4	New concrete - rubber mat test	2
1.5	Etching concrete	2
1.6	Hollow sounding concrete	2
1.7	Metal floors	2
1.8	Wood floors	2
1.9	Under cutting-keying of perimeters	3
1.10	Floor drains, floor penetration perimeters	3
2.0	SPOT REPAIRS - CRACKS, HOLES, JOINTS	
2.1	Control joints - no cracks	3
2.2	Control joints - cracked	3
2.3	Shrinkage cracks	3
2.4	Cracks over 1/8 " wide	3
2.5	Straight line cracks	3
2.6	Settlement cracks	3
2.7	Movement cracks	3
2.8	Expansion joints	4
2.9	Patching holes - over 1/2" deep	4
	- under 1/2" deep	4
2.10	Pitching floors to drains	4

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March 17, 1992

3.0	PRIMING	<u>PAGE NO.</u>
3.1	When to prime	5
3.3	ICO-Primer - Regular Cure	5
3.3.1	ICO-Primer - Fast Cure	5
3.3.2	ICO-Primer - Slow Cure	6
3.3.3	ICO-Primer - Water-based	6
3.3.4	ICO-Primer-SG, (Super Guard)	6
3.3.5	ICO-Primer SG - Fast Cure	6
3.4	Primer coverage rates	6
3.5	Set time of primers	6
3.6	Working on tacky primers	6
3.7	Protection of adjoining surfaces	6
3.8	Curing times of primers	7
3.9	Mixing primers	8
3.10	Mixing speed and time	8
3.11	ICO-Primer WB - diluting	8
3.12	Primer application	8
3.13	Primer application	8
4.0	MIXING OF MATERIALS	
4.1	Mixing speeds	9
4.2	Mixing containers	9
4.4	Mixing by kits	9
4.5	Using measuring buckets	9
4.6	Combining and mixing ingredients	9
4.7	Pigment	9
4.8	Ratios of ingredients - Trowelled Systems Charts	10
	- Self-levelling Systems, Coatings Chart	11
5.0	APPLICATION - TROWELLED SYSTEMS	
5.1	Application thickness	12
5.3	Gauging the thickness	12
5.4	Spreading mix	12
5.5	Backrolling	12
5.6	Anti-slip profile	12
5.8	Top-coating a trowelled system	12
5.9	Power-trowelling	13
5.10	Installing a cove base	13
5.11	Curing times for trowelled systems	14

INTERNATIONAL COATINGS INC.

7052 Barry Street, Rosemont, Illinois 60018 • 708/824-6070 • 800/624-8919 • Fax 708/824-6088

March 17, 1992

6.0	APPLICATION - SELF-LEVELLING SYSTEMS	<u>PAGE NO.</u>
6.1	Priming	15
6.2	Caution - Self-levelling systems on sloped floors	15
6.3	Establishing application thickness	15
6.4	Mixing speed	15
6.5	Spreading mix	15
6.6	Spiked rollers	15
6.7	Achieving desired finish appearance	15
6.8	Seeding to excess	16
6.9	Curing times at different temperatures	16-17
6.10	Color quartz aggregate application	18
7.0	APPLICATION - COATINGS	
7.1	Coating over old coatings	18
7.2	Priming	18
7.3	How applied and coverage rates	19
7.4	Spraying procedures	19
7.5	Recommended number of coats	19
7.6	Recoat procedures	20
7.7	Establishing anti-slip profile	20
7.8	Gloss reduction	20
7.9	Low temperature curing agents	20
7.10.0	ICO-Sealer for deeper gloss	20
7.10.1	ICO-Sealer rate of application	20
7.11	Vinyl Flake application	20
7.12	Application on metal	21
7.13	Curing times at different temperatures	22
7.14	Exterior applications	23
7.15	Clean-up of tools and equipment	23
8.0	PRECAUTIONS	
8.1	Material Safety Data pages	23
8.2	Protection of workers	23
8.3	Storage of materials	23
8.4	De-fuzzing application rollers	23
8.5	Length of time for full cure	23

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March 17, 1992

DRAWING DETAILS

PAGE NO.

1 Perimeter Key	24
2 Control Joint - No Crack Failure	25
3 Crack Repair	26
4 Expansion Joint	27
5 Corner Expansion Joint	28
6 Metal Base Plates	29
7 Drain	30
8 Corner Detail - No Expansion Joint	31
9 Cove Base	32
10 Cant Cove Base	33

Detrex, Melrose Park, IL
ILD074424938
RCRA Container Storage Facility
35 IAC 724.275(b)

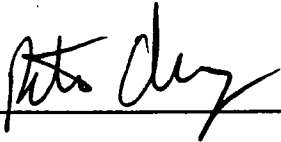
APPENDIX G

Inspection Statement

Detrex, Melrose Park, IL
ILD074424938
RCRA Container Storage Facility
35 IAC 724.275(b)

INSPECTION STATEMENT

I hereby certify under penalty of law that I have personally inspected the RCRA container storage area and associated containment system located at the Detrex Corporation, Melrose Park, Illinois facility (ILD074424938) on 6/19/92 and have not observed any evidence of cracks, gaps or joint separations which would impact the containment system's design and operation in accordance with 35 IAC Section 724.275.

Signed: 

Name/Title: Peter Alvey

Date: June 23, 1992



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March 17, 1992

INSTALLATION PROCEDURES FOR ICO FLOOR SYSTEMS

GENERAL INFORMATION

1.0 CLEANING OF THE SUBSTRATE

1.1 All floor surfaces that have a heavy accumulation of dirt or have a soft concrete surface should be cleaned by mechanically abrading the surface. This is the preferred method where there is no heavy contamination of oils, greases or chemicals. This can be done by using shot-blast, scarifying, sandblasting, scabbling or other mechanical methods of removing the dirt, old sealers or coatings, failing repair materials and soft concrete surface. This equipment should be used when the floor has been dampened with water or in conjunction with vacuum cleaning equipment to control dust.

1.2 Surfaces contaminated with oils, greases, wax, food products or chemicals must be cleaned of those materials before any mechanical abrading procedure is used. Petroleum based oils and greases should be removed with industrial strength emulsifying citrus degreasers and hot water rinses. Heavy accumulations can be scrubbed with caustic flake on a wet floor then rinsed or steam cleaned. A solution of TSP can be used to clean lightly soiled surfaces. Food fats and greases should be removed with food grade detergents and rinsed thoroughly. Waxes or wax based materials should be removed using wax strippers and power scrubbers. The recommendations of the manufacturer of the cleaning agent should be followed explicitly. Contact International Coatings for specific recommendations where any questions or concerns arise.

1.3 All failing paint, old sealers, cure and seals and failing toppings or repair materials must be removed. The toppings and repair materials can be removed by chipping and or mechanical abrasion. Thin film coatings can be removed by mechanical abrasion or by stripping with a paint stripper. If a stripper is used, the material will be more effective if poured on the floor and then covered immediately with a plastic sheet to retard evaporation of the solvent. The stripper can be broomed around by sweeping on top of the plastic sheet. After the film has softened it can be removed with sharp scrapers. A second application may be necessary. A rinse may be required to remove any stripping residue, depending on the manufacturers instructions. A final damp mopping using IPA (alcohol) and clean rags or towels on push brooms should leave the surface with a uniform dull appearance. Change the towels or rags periodically, as they load up with dust. If there are any areas of shine or gloss, repeat the stripping operation.

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March 17, 1992

- 1.4 New concrete should be allowed to cure a minimum of 14 days if it is high early concrete or 28 days if it is standard concrete. The water content should always be checked with a 24" x 24" rubber mat to determine if any migrating moisture vapor condenses under the mat. The area should be checked to determine how long it takes for moisture to darken the concrete under the mat. If moisture is present in less than 24 hours, the concrete should be allowed to cure longer. Increasing the air movement and temperature in the room will hasten the final cure. If waiting for a full cure presents a problem contact International Coating's Technical Department for instructions.
- 1.5 All new concrete, concrete with a shiny steel trowelled finish and lightly soiled concrete surfaces should be etched with a solution of one part muriatic acid and three parts water. This should be spread on the floor using sprinkler cans or spreader wands followed by scrubbing with brooms. After the acid has stopped bubbling the floor should be neutralized with a solution of ammonia and water, rinsing the surface until the final rinse water does not feel slippery when you rub it between your fingers. This restores the floor to a neutral ph. Allow the floor to dry and inspect for any white powder residue. If there is any present, rinse the floor then use a wet vac prior to allowing the floor to dry. The properly etched floor should have a surface texture similar to 200 grit sandpaper. If other types of acid free etching materials are used, the manufacturer's instructions should be adhered to explicitly and the end result must be the same. Always use a wet vac to pick up the "fines" that are left on the floor surface after cleaning. No amount of rinsing or hosing will remove these fine particles.
- 1.6 Highly trowelled concrete or floors that are losing the surface skin should be sounded by tapping with a hammer for hollow sounding concrete. Any areas found to be hollow must be removed by chipping, scraping, scabbling or scarifying.
- 1.7 Any metal surfaces should be cleaned of all loose or failing materials and rust by sanding, sandblasting, brush-blasting or power grinders. Remove any dust or oils by a solvent wipe using toluene or isopropyl alcohol. The metal should be coated immediately before any skim rust or corrosion starts developing. Any previously coated metal that appears to be sound should be cleaned then have a sample of the intended finish applied to check for adhesion or attack.
- 1.8 Wood floors should be sanded to remove all loose or failing coatings and contaminants. Oil or grease contamination should be removed by cleaning with appropriate cleaning materials as described in Paragraph 1.2 above. Extreme caution should be exercised to keep all water to an absolute minimum or irreparable damage can result. If the wood is saturated with a contaminant or is splitting or splintering it should be replaced or overlaid with 3/4" plywood fastened with wood screws 12" o.c.

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March 17, 1992

- 1.9 All perimeters that do not abut a wall or curb should be saw cut to a depth of 1/2". The inside edge of that saw cut shall be chipped away to form an undercut or key. See Drawing Detail 1.
- 1.10 The perimeter of all drains, the juncture of the floor with any metal and the perimeter of any floor penetration shall be undercut and keyed as in Paragraph 1.9 above.
- 2.0 **SPOT REPAIR OF CRACKS, JOINTS, HOLES**
- 2.1 Inspect all control joints (saw-cuts) to determine what joints, if any, are dynamic or moving joints. If no cracking has occurred in the control joint, no pre-treatment other than cleaning is necessary. These joints can be filled with ICO-Grout BL if the floor is going to be finished with a coating or sealer. If the floor is going to be covered with a trowelled system the trowelling mix can be used to fill these cracks. See Drawing Detail 2.
- 2.2 If there is a crack in the cut joint, the joint should be treated as a moving joint.
- 2.3 Cracks that run in an erratic, ragged fashion and start out at 1/8" in width gradually tapering to a hairline or less are usually shrinkage cracks and require no pre-treatment other than cleaning.
- 2.4 Cracks that are over 1/8" in width should be cut in a v-notch pattern with a 1/4" diamond wheel or crack chaser to a depth of 1/4" and filled by wiping ICO-Grout BL or epoxy overlayment into the joint, striking it off flush with the surrounding surface. See Drawing Detail 3.
- 2.5 Any cracks that run in a generally straight line and particularly cracks that run consistently parallel to a building plane should be treated as an expansion joint. See Drawing Detail 4.
- 2.6 Any cracks that appear to have been caused by building settlement or heaving of the base under the floor should also be treated as expansion joints. This type of crack is usually recognized by a difference in height of the floor on either side of the crack. These joints should be addressed after the application of the overall floor treatment system. See Paragraph 2.8.1.
- 2.7 Any cracks or joints suspected of being caused by movement can be checked by packing a non-shrink water based mortar or a plaster of paris mix into the joint. If the material cracks in 3 - 5 days there is too much movement for a hard setting joint material to be used. These joints should be filled with one of the ICO-Caulks.

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March 17, 1992

- 2.8.0 Any cracks described in Paragraph 2.7 above, any expansion joints, any joints where the floor meets a metal edge and any joint around any penetration through the floor should be treated as an expansion joint and filled with a material capable of absorbing the movement that is occurring. See Drawing Details 4,5,6,7,8.
 - 2.8.1 To establish an expansion joint in the new application, mark the position of the joint by inserting nails in the joints as markers before the application. After the material has set, snap a chalk line then saw cut to create a neat well defined joint. The depth of the saw cut should be 1" to 1 1/2" deep. The width will be a minimum of 3/4" wide or wider if the original joint was wider. Remove all dust and debris. Applying masking tape on the edge of the joint will improve the appearance of the application and make clean-up easier. See Drawing Detail 4.
 - 2.8.2 Insert closed cell joint backing in the joint using a large enough size to be under 30% compression. The joint backing should be pushed down to a depth that is one-half the width of the joint. See Drawing Detail 4.
 - 2.8.3 Fill the joint opening with ICO-Caulk bringing it flush with the surface. The sealant should be tooled with a slicker stick or spatula dipped in soapy water or solvent to firmly push the sealant against the joint backing and the joint sides. Remove the masking tape carefully after the ICO-Caulk has started to get tacky but before it has set. Wipe the edges of the joint application to remove any tape adhesive or caulking.
- NOTE:** When caulking exterior joints use urethane base caulk Vulkem 116. When caulking joints exposed to chemical attack use ICO-Caulk X.
- 2.9 Any areas to be patched that are over 1/2" deep should be patched with ICO-Patch and should be primed with ICO-Primer. The repaired area should be primed before covering with the finish system.
 - 2.9.1 All holes, divots or depressions under 1/2" in depth should be filled with ICO-Guard FC 51 or ICO-Grout BL.
 - 2.10 In any area where the pitch or slope of the floor needs to be corrected, the surface should be prepared as described in Paragraph 1.0 and Primed as in Paragraph 3.0.
 - 2.10.1 Determine the amount of fill required by use of a transit, establishing a minimum of 1/4" fall per 12". Mark the height on the perimeter wall or drive a masonry nail into the existing floor and tie a length of string on the nail at the height of the fill at various points around the perimeter. Add 1/4" to the fill height to allow for the minimum thickness of the finish overlayment.

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March 17, 1992

- 2.10.2 Stretch the strings to the drain or drains and tie it to a mark on a nail 1/4" above the existing surface. The nail should be placed approximately 12" back from the drain. This allows the finish overlayment of 1/4" to taper from the edge of the fill mix down to a 1/4" depth of drain.
- 2.10.3 After mixing a batch of ICO-Patch, place the mix around the strings using them as a guide to judge the depth of the application. The amount of material should be slightly higher than the string to allow for smoothing and levelling. A 3 - 4" wide ribbon of material can be placed along the string, patting it in place with a trowel.
- 2.10.4 Place additional batches of material between the strips of material along the strings. Use a 4 - 6 foot straight edge of steel, wood or aluminum to strike off the material to a smooth uniform surface.
- 2.10.5 Finish the fill layer with a steel trowel to bring the resin to the surface closing it off. Allow approximately 3 - 4 hours drying time.
- 2.10.6 Apply ICO-Primer FC liberally to the surface. Allow to dry to at least a tacky state, approximately 20 - 30 minutes before applying the finish floor.

3.0 PRIMING

- 3.1 Priming is mandatory before applying all ICO Systems except for all ICO-Guard materials except ICO-Guard 71. It is not mandatory for the Hi-Guard Coating and Hi-Guard Self-levelling systems. When applying any of the ICO Systems over very open or porous concrete or on wood it is advisable to prime to prevent excessive absorption of the mix resin into the substrate creating "dry" spots in the finish floor. Priming also helps prevent outgassing and air entrapment which will produce pinholes and blisters.
- 3.2 Priming should be done following the instructions for each product.
- 3.3 ICO-Primer (regular cure) should be used for outdoor applications or for large areas and particularly areas where warmer temperatures exist to allow for longer working times.
 - 3.3.1 ICO-Primer FC should be used for applications in the temperature range of 32°F to 50°F surface temperature. It also should be used at warmer temperatures when a faster tack time is desired to allow the application to proceed at a faster pace. It will have a tack time of about 40 minutes at 75°F.

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March 17, 1992

- 3.3.2 ICO-Primer SC is a slow cure primer that gives the deepest penetration. It should be used where moisture or vapor migration is a problem.
- 3.3.3 ICO-Primer WB is a penetrating material that is better able to enter the pores of the concrete thereby reducing the outgassing problem. It cannot be used by itself, except for ICO self priming systems. When using ICO products that require a primer, apply the recommended primer over the WB and allow to dry.
- 3.3.4 ICO-Primer SG is the primer to be used with any of the Super Guard materials applied at temperatures above 50°F.
- 3.3.5 ICO-Primer SG FC should be used with the Super Guard materials when they are being applied between 32°F and 50°F.
- 3.4 The coverage rate of the primers are dictated by the surface porosity. Average coverage on concrete will be 150 - 200 sq. ft. per gallon. The coverage on wood will be 100 - 150 sq. ft. per gallon. The intent is to thoroughly wet the surface. If the primer appears to soak into the surface and then produce a dry spot, the area should be recoated with the primer. Do not allow puddling of the primer as this will affect the cure time and could also cause streaking of the finish surface.
- 3.5 The primer application should be allowed to cure to the tacky state before proceeding with the finish application. Going over the primer too soon could cause bleeding and slipping of the top coat. Do not allow the primer to cure completely to the hard state. Do not allow it to set up more than one hour in direct sunlight. If the primer is hard it should be sanded then re-primed.
- 3.6 The application of the finish material should be done using spike shoes and working off of elevated knee boards that are raised by using bolts through the knee board.
- 3.7 Crew members transporting the mix from the mixing area to the point of application should travel over plastic sheets or other protection for the floor surface in those areas. They should not walk on the primed surface but instead hand the buckets of mix to the finishers at the edge of the application.

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March 17, 1992

3.8 Cure Times - Primers

The following times are all affected by surface temperature, mixing rate, applied thickness, air temperature, etc. The following table illustrates the effect temperature has on each material.

	Pot Life			Time to Tack			Set Hard		
Product	60°	75°	90°	60°	75°	90°	60°	75°	90°
ICO-Primer	60 mins.	50 mins.	25 mins.	6 hrs.	5 hrs.	3 1/2 hrs.	24 hrs.	15 hrs.	5 hrs.
ICO-Primer SG	60 mins.	50 mins.	25 mins.	6 hrs.	5 hrs.	3 1/2 hrs.	24 hrs.	15 hrs.	5 hrs.
ICO-Primer FC	30 mins.	25 mins.	15 mins.	1 1/4 hrs.	40 mins.	25 mins.	6 hrs.	3 1/2 hrs.	2 1/4 hrs.
ICO-Primer SG FC	20 mins.	12 mins.	7 mins.	45 mins.	30 mins.	20 mins.	4 hrs.	2 1/2 hrs.	1 3/4 hrs.
ICO-Primer SC	14 hrs.	10 hrs.	6 hrs.	36 hrs.	30 hrs.	24 hrs.	42 hrs.	36 hrs.	30 hrs.
ICO-Primer WB	1 3/4 hrs.	1 1/2 hrs.	1 hr.	1 3/4 hrs.	1 1/4 hrs.	1 hr.	3 hrs.	2 hrs.	1 1/2 hrs.

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March 17, 1992

- 3.9 Mixing of the primer should be accomplished according to the correctly proportioned containers supplied. The Part A container is mixed with the Part B container. The proportions must be maintained exactly, if less primer is needed then the kit size supplied.
- 3.10 The two liquids in Part A and Part B should be mixed using a low speed mixing paddle, less than 700 RPM. Mixing for 1 - 2 minutes will produce a uniform consistency and color with no streaks.
- 3.11 ICO-Primer WB should be diluted 50% with water and applied at a coverage rate of 250 - 300 sq. ft. per gallon.
- 3.12 The primer should be applied using short nap rollers (1/4") at 100 - 150 sq. ft. per gallon on wood and 150 - 200 sq. ft. per gallon on concrete. The primer should be applied in a uniform application without puddling. If dry spots appear as the material sets apply another coat of primer to the dry area.
- 3.13 The roller should be dipped into the primer and rolled out using a full roller. Roll at a moderate rate of speed. Do not pour the primer on the floor and roll out the puddle. The roller should be kept wet, do not attempt to stretch the primer. A liberal application should be applied, eliminating all voids and misses as the application proceed.

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March 17, 1992

4.0 MIXING OF MATERIALS

- 4.1 Mixing should be done at low speed (maximum 700 RPM) mixing paddle in an appropriate sized container. The paddle should be square on the bottom to insure thorough mixing of materials in the corners of the mixing container.
- 4.2 Mixing can be done in a mortar mixer if larger batches are desired. A mixer with a fiberglass tub should be used for ease of cleaning. A four bag mixer can usually hold 4 - 4 gallon kits or four bags of aggregate and the necessary resin and hardener. This would be sufficient material to cover 100 - 108 sq. ft. at 1/4" depth.
- 4.3 When using drums, gate valves should be used on the drums to allow for accurate measuring of the ingredients. Barrel cradles are also helpful in handling the barrels.
- 4.4 Products supplied in pre-measured kits are mixed by combining the Part A liquid container with the Part B liquid container and mixing 30 - 60 seconds or until uniform. **DO NOT** add any solvent. Fast cure and extra fast cure materials should only be mixed for no more than 1/2 minute.
- 4.5 If the product is supplied in 5-gallon bulk kits or 50 gallon drums, the mixing ratios are determined by the marked mixing buckets supplied with the materials.
- 4.6 After the two liquids are mixed together the aggregate is added slowly to the liquid. Add approximately half of the correct amount of aggregate then add the bag of pigment before adding the balance of the aggregate. Mix for approximately one to two minutes or until the mix is uniform. Make sure that the material in the bottom of the mix container is thoroughly mixed.
- 4.7 When mixing products supplied in bulk packs or drums, the pigment is supplied in bulk also. There is a measuring cup in the pigment and one cup of pigment is added for each 50# bag of aggregate. If the pigment is supplied in plastic pouches, one pouch should be used for each 50# bag of aggregate.
- 4.8 The ratios of Part A to Part B and ratios of liquid to aggregate for each product are listed below. These mixing ratios will vary slightly with color. The ratios listed are for gray ICO-Guard products and for red ICO-Hi Guard and Super Guard products. Allowable tolerances are +/- 5% to assure the final mix will yield the properties listed in the Product Data pages.

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March 17, 1992

4.8 (cont.)

Mixing Ratios - Trowelled Systems

Products	Ratio of Part A to Part B		Ratio of Filler to Liquid	
	By Weight	By Volume	By Weight	By Volume
ICO-Super Guard	3.2:1	3.2:1	4:1	2.7:1
ICO-Super Guard X	7.5:1	7.1:1	4:1	2.7:1
ICO-Hi Guard	2.4:1	2.4:1	5:1	3.3:1
ICO-Guard 51	2:1	1.8:1	5:1	3.3:1
ICO-Guard 51 FC	3.2:1	2.9:1	5:1	3.3:1
ICO-Guard 71	2:1	1.8:1	7:1	4.6:1
ICO-Guard 71 FC	3.1:1	2.8:1	7:1	4.6:1
ICO-Patch	3.5:1	2.8:1	10:1	6:1
ICO-Guard Liner	2.2:1	2:1	2.2:1	1.2:1
ICO-Liner	3.8:1	4:1	2:1	1.2:1

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March 17, 1992

4.8 (cont.) Mixing Ratios for Self-levelling Systems, Coatings and Primers

Products	Ratio of Part A to Part B		Ratio of Filler to Liquid	
	By Weight	By Volume	By Weight	By Volume
ICO-Super Guard SL	3.4:1	3.2:1	1.5:1	1:1
ICO-Hi Guard SL	2.9:1	2.7:1	1.5:1	1:1
ICO-Guard SL	2.4:1	2:1	1.5:1	1:1
ICO-Super Guard Ctg.	3.8:1	3.5:1		
ICO-Super Guard Ctg. FC	3.8:1	3.5:1		
ICO-Hi Guard Coating	3.5:1	3:1		
ICO-Hi Guard Ctg. FC	3.5:1	3:1		
ICO-Guard Coating	3.2:1	2.3:1		
ICO-Guard Coating FC	3.5:1	2.6:1		
ICO-Guard Coating XFC	3.9:1	2.8:1		
ICO-Primer	2:1	1.8:1		
ICO-Primer FC	3.2:1	3:1		
ICO-Primer SC	2.6:1	2.6:1		
ICO-Primer WB*	1:3	1:3.4		
ICO-Primer SG	2.6:1	2.6:1		
ICO-Primer SG FC	5.5:1	5.5:1		
ICO-Sealer	2.1:1	1.9:1		
ICO-Sealer FC	2.3:1	2.1:1		

* Water Base primer is measured at a ratio of 1 part A to 3 parts B by weight or by volume 1:3.4.

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March 17, 1992

5.0 APPLICATION - TROWELLED SYSTEMS

- 5.1 The normal depth of the ICO trowelled systems is at 1/4". While the materials can be applied at any thickness over the particle size of the aggregate, it is very difficult to maintain a smooth level profile below 3/16" on a typical concrete floor.
- 5.2 For overall applications below 3/16" in thickness, it is more practical to use ICO-Grout - Bricklayers consistency or an ICO-Self-levelling system.
- 5.3 The mixed batch should be poured onto the floor in a ribbon approximately 12" wide. The depth of the application can be gauged by using a screed box, gauge rake set at 1/4", a 4 - 6 foot long strike-off made of metal or wood, or by using metal screed rods or strips 1/4" thick. If a strike-off is used, it should have a screw or nail protruding 1/4" from the bottom on each end.
- 5.4 After rough spreading the material to the desired thickness use a steel trowel to close the surface. Because of the resin rich nature of the material, the action of the trowel will bring the resin to the surface. Do not use a lot of pressure on the trowel or over trowel the mix.
- 5.5 Approximately 10 minutes after trowelling the material the application should be lightly backrolled with an aluminum ribbed roller or a disposable short nap roller, 3/16" - 1/4". To prevent pick-up of the surface, dip the roller in solvent and squeeze out the excess. The weight of the roller is usually sufficient to erase any trowel marks and imperfections as well as bringing resin to the surface, creating a uniform finish.
- 5.6 To obtain a more anti-slip profile, the floor can be broadcast with sand, aluminum oxide or other desired aggregate after the backrolling or during the backrolling. Using the aggregate in conjunction with the backrolling tends to lock the aggregate in the resin. Do not wait until the material starts to gel to broadcast the grit.
- 5.7 If more profile is desired, the finish trowelling can be done with an aluminum float or the trowelled surface can be lightly broomed with a broom or brush.
- 5.8 Coating a trowelled ICO system is not necessary and not recommended. The high gloss finish of ICO coatings will accentuate every imperfection in the surface. Because of the resin rich nature of the ICO systems even a light coating could load up the surface eliminating any surface profile. This could produce a slippery surface when wet. The open, porous nature of some competitor's trowelled systems could be satisfied with an application of one of the 100% solids ICO coatings. If done, a light seeding into the wet application with an anti-slip grit would be advisable.

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March 17, 1992

- 5.9 The only ICO material that can be power trowelled is ICO-Guard 71. The directions for power trowelling ICO-Guard 71 will be included in that product's data page.
- 5.10 The building of cove bases should be done with a mix made by adding ICO-Thickener to the overlayment mix to body it up. This material is designed for a trowel application on vertical surfaces. Extra thickener should be ordered with the overlayment material to allow for altering the mix on the job. This will allow for higher temperatures that may cause the standard mix to slump. See Drawing Detail 9 and 10.
 - 5.10.1 The application of a cove base should include the installation of a cap strip to form the termination point of the top of the cove. See Drawing Detail 9.
 - 5.10.2 Any coving cap strip installed in areas that may be subjected to water or chemical exposure should be continuously sealed to the wall with a quick-set adhesive or caulked with urethane caulk, like Vulkem 116, to prevent penetration of liquid behind the cove base.
 - 5.10.3 The base of a cove installation can be terminated with a cove base strip. This strip should be an "L" that is 1/4" x 1/4" or the thickness of the overlayment if it is thicker than 1/4". The base strip should also be set in a quick-set adhesive to hold it in place while the application of the overlayment proceeds. If the floor overlayment was completed before the cove work is started, the edge of the overlayment can act as the base of the cove. See Drawing Detail 9.
 - 5.10.4 To add cove to existing floor, a double saw cut should be made approximately 3" out from the juncture of the wall and floor. This double saw cut should create a joint at least 1/4" wide and 1/4" deep. This joint acts as the receiver for the cove base.

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March 17, 1992

5.11 Cure Times - ICO Trowelled Floor Systems

The following times are all affected by surface temperature, mixing rate, applied thickness, air temperature, etc. The following table illustrates the effect temperature has on each material. Note that all materials were mixed at room temperature initially and then immediately transferred to the indicated temperatures.

	21°F	32°F	50°F	77°F	90°F
ICO-Guard 51					
Pot Life			60 min.	50 min.	25 min.
Hard for Foot Traffic			18 hrs.	15 hrs.	5 hrs.
ICO-Guard 51 FC					
Pot Life		50 min.	45 min.	30 min.	10 min.
Hard for Foot Traffic		18 hrs.	14 hrs.	3 1/2 hrs.	2 3/4 hrs.
ICO-Guard 41-XFC					
Pot Life	30 min.	25 min.	20 min.	15 min.	10 min.
Hard for Foot Traffic	18 hrs.	18 hrs.	7 hrs.	2 hrs.	1 1/2 hrs.
ICO-Hi Guard					
Pot Life			60 min.	50 min.	25 min.
Hard for Foot Traffic			18 hrs.	15 hrs.	5 hrs.
ICO-Super Guard					
Pot Life			60 min.	50 min.	25 min.
Hard for Foot Traffic			18 hrs.	15 hrs.	5 hrs.
ICO-Super Guard X					
Pot Life	30 min.	25 min.	20 min.	15 min.	10 min.
Workable on Tile	2 min.	3 min.	20 min.	20 min.	15 min.
Hard for Foot Traffic	18 hrs.	18 hrs.	7 hrs.	2 hrs.	1 1/2 hrs.

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March 17, 1992

6.0 APPLICATION - SELF-LEVELLING SYSTEMS

- 6.1 Priming with ICO-Primer WB will help prevent outgassing. This can be done before the application of ICO-Guard SL and ICO-Hi Guard SL. It is advisable but not mandatory. The WB Primers should be allowed to dry completely before covering.
- 6.1.1 Priming with ICO-Primer SG is mandatory when applying ICO-Super Guard SL. The application of ICO-Super Guard SL must be done while the primer is still tacky. (See Paragraph 3.5).
- 6.2 **CAUTION** - Do not apply any self-levelling system on floors that are pitched to drains without first applying a sample area. Normally if there is 1/8" slope per foot or more a self levelling system should not be used. Adding sand to the mix can body up the material to make it stay in place on sloping surfaces.
- 6.3 Mark off the floor in panels that would correspond to the size of the planned mix volume and the desired finish thickness. If mixing a four gallon kit and applying the material at 1/8" thick, or 125 mils, a panel of approximately 50 square feet should be marked. At 1/8" the yield is 12.8 sq. ft. per gallon. Allow at least 10% overage factor. Cracks, divots or holes and depressions will detract from that coverage area. A self-levelling system cannot be applied less than 1/16" thick or 100 sq. ft. per 4 gallon kit.
- 6.4 Mixing should only be done with a mixing paddle at 700 RPM or less.
- 6.5 Immediately after mixing (see Paragraph 4.0) pour the entire mix onto the floor in a ribbon and spread with a notched squeegee, notched trowel or gauge rake to the desired thickness. After spreading the material it will seek it's own level and air bubbles will rise to the surface and break.
- 6.6 The surface can be rolled very slowly with a spiked or pin roller to facilitate breaking the bubbles that are not breaking by themselves. This must be done before the materials starts to gel. If the system being applied is a fast cure self-levelling system, it will have to be spike rolled. Do not walk in the material unless wearing spiked shoes.
- 6.7 If a very smooth finish is not desired, apply a coat of one of the ICO-Guard coatings as soon as the self-levelling system is hard enough to walk on. While still wet, broadcast an aggregate onto the surface.

CAUTION - Do not broadcast the aggregate into the self-levelling material, it will settle down into the self-levelling material and disappear, leaving a smooth surface, again.

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March 17, 1992

- 6.7.1 The size of the aggregate particle and the amount of aggregate used will determine the profile that will be established. A test panel should always be applied to insure agreement on the surface finish before doing the entire application area.
- 6.7.2 It is advisable to make up panels beforehand showing the rate and type of broadcast. Once accepted by the owner, the panel can be cut in thirds with a third retained by each party, the owner, the contractor and the specifier.
- 6.7.3 When the aggregate is broadcast into an application, it should be thrown up in the air over the floor allowing it to float down in a more dispersed fashion.
- 6.8 An alternative finish technique to that described in Paragraphs 6.7 - 6.7.3 is to seed the self-levelling material to excess while it is still wet. After the material is dry enough to walk on, the excess aggregate can be vacuumed off the surface and a coat of one of the ICO Coatings can be applied. The aggregate will almost double the finished thickness of the application, depending on the type and particle size used.
- 6.9 Cure times are greatly dependent on surface temperatures, mix ratios and air temperature. It is important to allow for the floor temperature being approximately 10° colder than the air temperature.

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March 17, 1992

6.9 (cont.) Cure Times - Self-levelling Systems

The following times are all affected by surface temperature, mixing rate, applied thickness, air temperature, etc. The following table illustrates the effect temperature has on each material. Note that all materials were mixed at room temperature initially and then immediately transferred to the indicated temperatures.

Product	21°	32°	50°	77°	90°
ICO-Guard SL					
Pot Life			60 min.	50 min.	25 min.
Hard for Foot Traffic			18 hrs.	15 hrs.	5 hrs.
ICO-Guard SL FC					
Pot Life		45 min.	40 min.	25 min.	15 min.
Hard for Foot Traffic		18 hrs.	14 hrs.	3 1/2 hrs.	2 3/4 hrs.
ICO-Guard SL XFC					
Pot Life	25 min.	20 min.	15 min.	12 min.	7 min.
Hard to Foot Traffic	18 hrs.	18 hrs.	5 hrs.	2 1/2 hrs.	2 hrs.
ICO-Hi Guard SL					
Pot Life			60 min.	50 min.	25 min.
Hard for Foot Traffic			18 hrs.	15 hrs.	5 hrs.
ICO-Super Guard SL					
Pot Life			60 min.	50 min.	25 min.
Hard for Foot Traffic			18 hrs.	15 hrs.	5 hrs.
ICO-Super Guard X/SL					
Pot Life	25 min.	20 min.	15 min.	12 min.	7 min.
Hard for Foot Traffic	18 hrs.	18 hrs.	5 hrs.	2 1/2 hrs.	2 hrs.

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March 17, 1992

- 6.10 A color quartz floor system can be made by using 28 grade quartz granules in conjunction with ICO-Sealer or with ICO-guard SL as follows:
 - 6.10.1 If using ICO-Sealer, it should be applied to the floor at the rate of approximately 150 sq. ft. per 4 gallon kit.
 - 6.10.2 Cover the ICO-Sealer completely with the quartz aggregate in pre-mixed colors. Allow to dry to the touch.
 - 6.10.3 Remove all loose granules by sweeping or vacuuming. Sand any projections or rough areas.
 - 6.10.4 Apply a top coat of ICO-Sealer at the rate of 100 - 150 sq. ft. per gallon. A second top coat of ICO-Sealer should be applied for improved performance.
 - 6.10.5 If using ICO-Guard Self-levelling, order the ICO-Guard SL without pigment. Apply the ICO-Guard SL to the floor at 75 sq. ft. per gallon.
 - 6.10.6 Completely cover the ICO-Guard SL immediately with the pre-mixed color quartz granules. Allow to dry.
 - 6.10.7 Remove all loose granules by sweeping or vacuuming sand as needed to remove rough or projecting granules.
 - 6.10.8 Apply a top coat of ICO-Guard SL at 75 - 100 sq. ft. per gallon.

7.0 APPLICATION - COATINGS

- 7.1 ICO coatings can be applied over most previously applied coatings that are a sound films with no evidence of peeling or loss of bond to the substrate. The old coating should be sanded lightly to roughen the surface and enhance the mechanical bond. A sample of one of the ICO coatings can be applied to see if there is any adverse reaction such as wrinkling or peeling. If there is a reaction, the old coating should be completely removed. The ICO coatings are pigmented and where a clear sealer is desired, ICO-Sealer can be used. ICO-Sealer is a clear epoxy sealer.
- 7.2 Priming with one of the ICO Primers is not mandatory when applying ICO-Hi Guard or ICO-Guard Coatings but priming with ICO-Primer WB is recommended when the application is over new concrete or very porous concrete to prevent air bubbles and pinholing. (Refer to Priming 3.3.3)

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March 17, 1992

- 7.2.1 Priming can also be accomplished with a coat of ICO-Guard Coating or ICO-Hi Guard Coating as a pigmented base coat material in place of one of the ICO Primers. The material can be reduced 10% with toluene to improve flowability on the first coat.
- 7.2.2 Priming is mandatory when applying ICO-Super Guard Coating. (See Paragraph 3.3.4)
- 7.3 ICO Coatings can be applied by brush, roller or spray on vertical surfaces, walls, equipment or on floors. Short nap rollers are recommended.
- 7.3.1 On any vertical surfaces that are to be coated, fill all openings, cavities and bugholes with ICO-Gel, applied by spatula, trowel or squeegee. Press the paste firmly into the cavity to insure there are no air pockets or voids. Then strike off the material flush and smooth with the surrounding surface. Allow the paste to set before coating. Note: If bugholes are not filled, then we recommend heavily seeding the coating with silica sand to minimize outgassing.
- 7.3.2 ICO Coatings are normally applied at the rate of 150 - 200 sq. ft. per gallon per coat, depending on surface porosity, yielding 8 - 10 mils dry film thickness.
- 7.4 Spraying ICO Coatings can best be accomplished using an airless sprayer using an orifice size of .018 - .022 and a fan size of 35° - 50° depending on the surface being coated and the length of pole gun used. Nozzle pressure should be at least 300 psi. to provide adequate atomization. The material should be reduced 10% with toluene. A trial application should be made with the equipment to determine the best fan and orifice sizes.
- 7.4.1 The normal application rate when spraying on a horizontal surface is up to 20 - 30 mils per pass on the first coat. The second coat coverage will be about half that millage. Larger orifice size and narrow fans will increase this.
- 7.4.2 Spraying on a vertical surface will be done at approximately 8 - 10 mils on the first coat. The second coat coverage will be approximately 4 - 5 mils. After spraying the material, the surface should be backrolled immediately.
- 7.4.3 Mineral spirits or toluene should be run through the equipment before the coating to pre-wet the hoses. Periodic cleaning of hoses, guns and equipment should be done during each day to prevent build-up and partial curing of the material in or on the equipment.
- 7.5 Multiple thin coats are always recommended over fewer thick coats. Where chemical attack exists, a minimum of two coats should always be used. The next coat can be applied as soon as the previous coat can be walked on or when it is tacky, if spiked shoes are used for the workers. Re-coating must be done in less than 24 hours or the surface must be lightly sanded

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March 17, 1992

before applying the next coat.

- 7.6 ICO-Super Guard Coating should be recoated in 24 hours or less at 75°F. After 24 hours the previous coat should be sanded and primed with ICO-Primer SG. The next coat of the coating should be applied while the primer is tacky.
- 7.7 In order to establish an anti-slip profile to any surface coated with one of the ICO coatings, an aggregate should be lightly broadcast into the primer or base coat and immediately back-rolled with a roller. The aggregate will be locked in place when succeeding coats are applied.
- 7.8 Silica flour can be broadcast into the wet coating to reduce the gloss of the finish without producing a surface profile or degree of roughness.
- 7.9 If surface temperatures are going to be below 50°F, the coating can be ordered with a fast cure, or extra fast cure catalyst if the temperature is below 32°F. If this is used, the material should be spread with notched squeegees then rolled with short nap rollers to increase the speed of application.
- 7.10.0 ~~ICO-Sealer can be applied over ICO coatings to produce a deeper gloss to an ICO coating, to seal in place ICO vinyl flakes, to seal bare concrete or wood surfaces or to seal the surface of ICO-Guard 71 to establish a uniform glossy surface.~~
- 7.10.1 ICO-Sealer can be applied at a rate of 150 - 200 sq. ft. per gallon or heavier depending on surface porosity and gloss desired. It can be reduced by adding 10% toluene to improve spreadability particularly at lower temperatures.
- 7.11.0 The application of ICO vinyl flakes can be accomplished by broadcasting the flake into a wet coat of pigmented ICO coating. The flakes should be tossed up into the air and allowed to float down on the surface, not thrown at the surface. Allow the application to dry until it is hard enough to walk on. Anti-slip aggregate can be applied at this time also.
- 7.11.1 Remove any loose flakes by sweeping or vacuuming. Lightly sand the surface to remove any sharp edges, if necessary.
- 7.11.2 Apply at least one coat of ICO-Sealer at the rate of 150 sq. ft. per gallon with a short nap roller. Anti-slip aggregate can also be applied in the wet seal coat, but it is advisable to apply an additional coat of ICO-Sealer if this is done.

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March 17, 1992

- 7.11.3 If air bubbles or pinholes are present, the surface can be backrolled with a spiked roller if it is still wet. Close off all air ducts that may be causing drafts on the surface. Do not mix over 700 rpm. Do not whip air into the material by rolling too fast or using a medium or long nap roller.
- 7.12.0 An application on steel that has not rusted should be at the rate of 500 sq. ft. per gallon per coat with a minimum of two coats. This will yield approximately 3 mils per coat.
- 7.12.1 An application on steel that has been pitted with rust should include a prime coat of ICO-Primer applied at the rate of 300 sq. ft. per gallon. This should be followed by two 3 mil coats of the appropriate ICO coating.

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March 17, 1992

7.13 Cure Times - Coatings

The following times are all affected by surface temperature, mixing rate, applied thickness, air temperature, etc. The following table illustrates the effect temperature has on each material. Note that all materials were mixed at room temperature initially and then immediately transferred to the indicated temperatures.

Product	21°F	32°F	50°F	77°F	90°F
ICO-Guard Coating					
Pot Life			60 min.	50 min.	25 min.
Hard for Foot Traffic			18 hrs.	15 hrs.	5 hrs.
ICO-Guard Coating FC					
Pot Life		45 min.	40 min.	25 min.	15 min.
Hard for Foot Traffic		15 hrs.	12 hrs.	3 1/2 hrs.	2 1/4 hrs.
ICO-Guard Coating XFC					
Pot Life	25 min.	20 min.	15 min.	12 min.	7 min.
Hard for Foot Traffic	18 hrs.	18 hrs.	5 hrs.	2 hrs.	1 1/4 hrs.
ICO-Hi Guard Coating					
Pot Life			60 min.	50 min.	25 min.
Hard for Foot Traffic			18 hrs.	15 hrs.	5 hrs.
ICO-Super Guard Coating					
Pot Life			60 min.	50 min.	25 min.
Hard for Foot Traffic			18 hrs.	15 hrs.	5 hrs.
ICO-Super Guard X Coating					
Pot Life	25 min.	20 min.	15 min.	12 min.	7 min.
Hard for Foot Traffic	18 hrs.	18 hrs.	5 hrs.	2 hrs.	1 1/4 hrs.

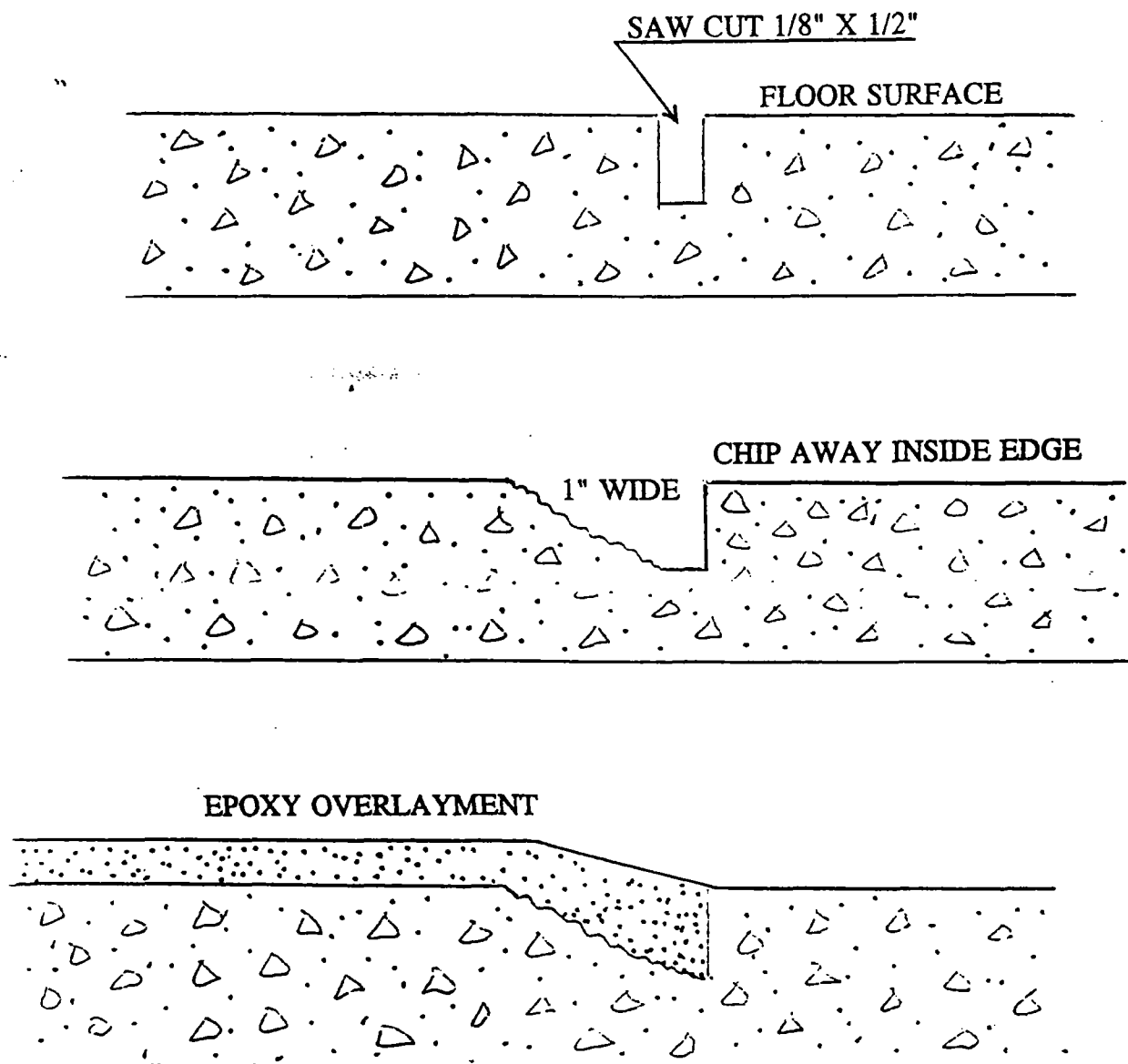
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March 17, 1992

- 7.14 When ICO coatings are applied outside they will eventually tend to chalk lightly which does not affect the chemical or physical performance. If later appearance after aging is a factor, the overall application of these materials should include a top coat of U.V. resistant coating.
- 7.15 Equipment and tools can be cleaned before the materials start to cure with xylene, toluene, lacquer thinner or similar solvent. ICO-Guard 51, ICO-Guard Coating and ICO-Hi Guard Coating can be cleaned off tools and equipment with warm soapy water. After the materials are cured, it will be necessary to use paint stripper to remove the materials from tools.
- 8.0 PRECAUTIONS
- 8.1 CONSULT THE APPROPRIATE MATERIAL SAFETY DATA PAGES BEFORE USING ANY OF THE ICO MATERIALS.
- 8.2 Protective hand creams should be applied to any exposed skin of the workers hands and arms, or rubber or heavy plastic gloves should be worn. Clothing should cover arms and legs, etc. Because the materials are 100% solids, no special masks or ventilation equipment are needed. When handling silica sand or other aggregates, dust masks should be worn.
- 8.3 Materials should always be stored at temperatures between 65 and 75°F. The materials will have at least a one year shelf life at that temperature range. If the materials, including aggregate, are stored or transported at colder or hotter temperatures they should be stored for several days at the desired range prior to application.
- 8.4 All rollers should be totally wrapped with masking tape before using. When the tape is removed at the start of the application it pulls the loose fuzz and lint from the roller so it is not deposited in the coating.
- 8.5 The maximum cure on ICO materials is reached at approximately seven days curing time at 75°F. Prior to that time the new application could be damaged by heavy loads, sharp gouging and severe chemical exposure. Necessary precautions should be exercised to prevent damage to the application. Refer all questions or concerns to International Coatings Technical Department.

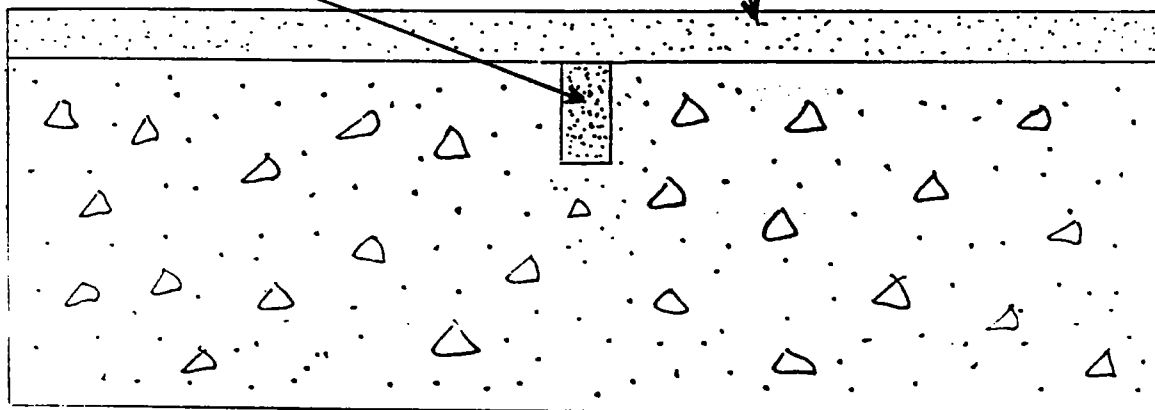
DRAWING DETAIL 1. PERIMETER KEY



DRAWING DETAIL 2. CONTROL JOINT - NO CRACK FAILURE

ICO-GROUT BL
OR
EPOXY FLOOR

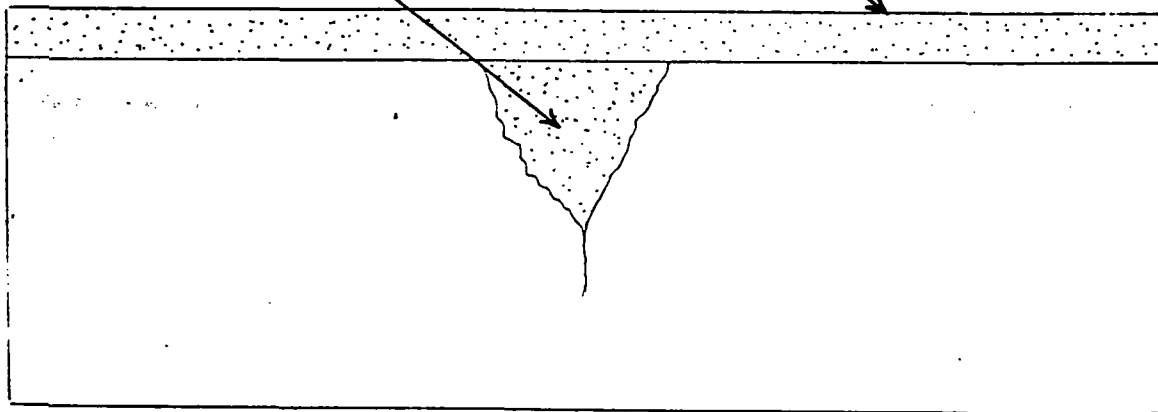
EPOXY FLOOR



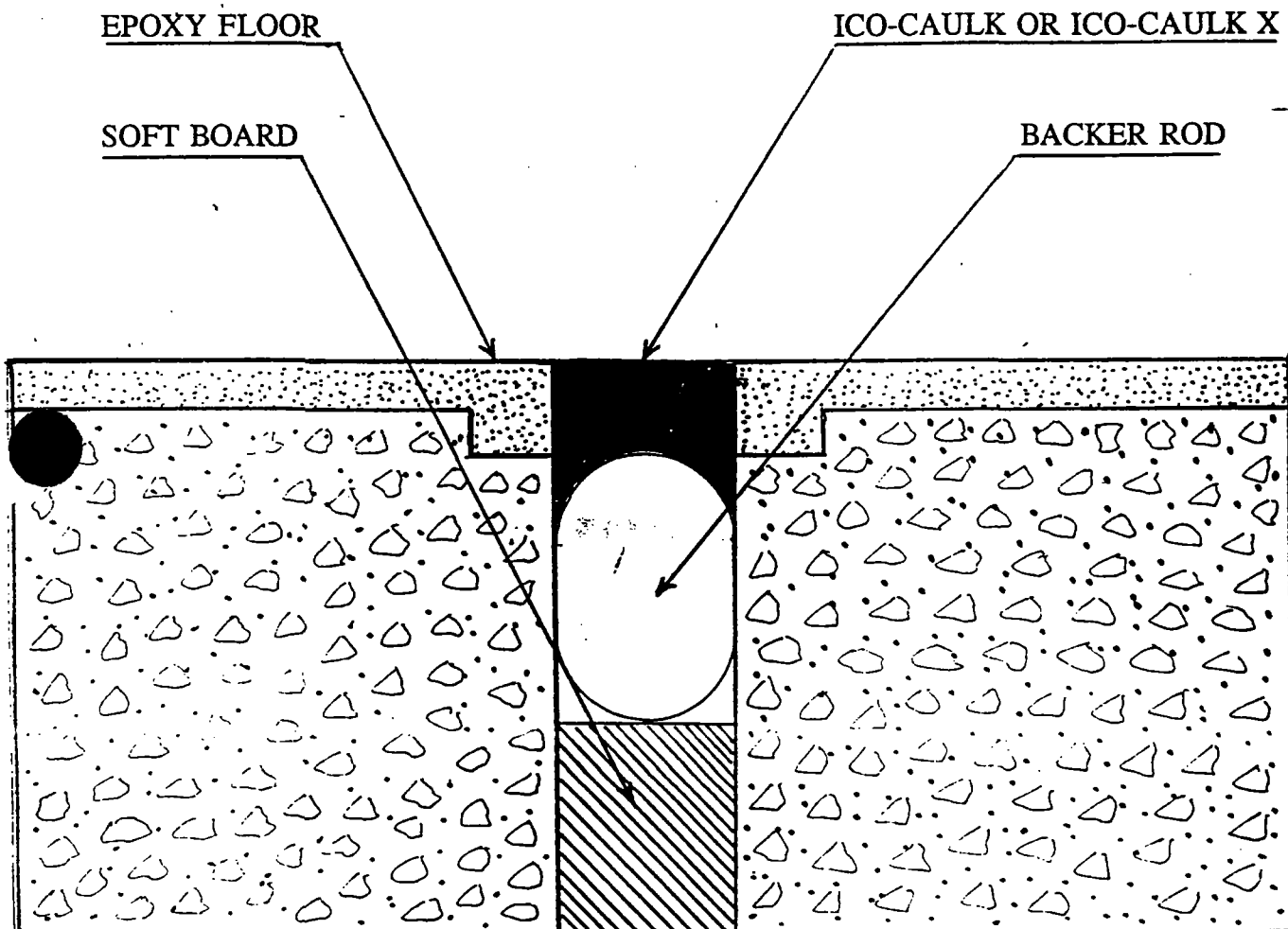
DRAWING DETAIL 3. CRACK REPAIR

EPOXY GROUT
OR FLOOR

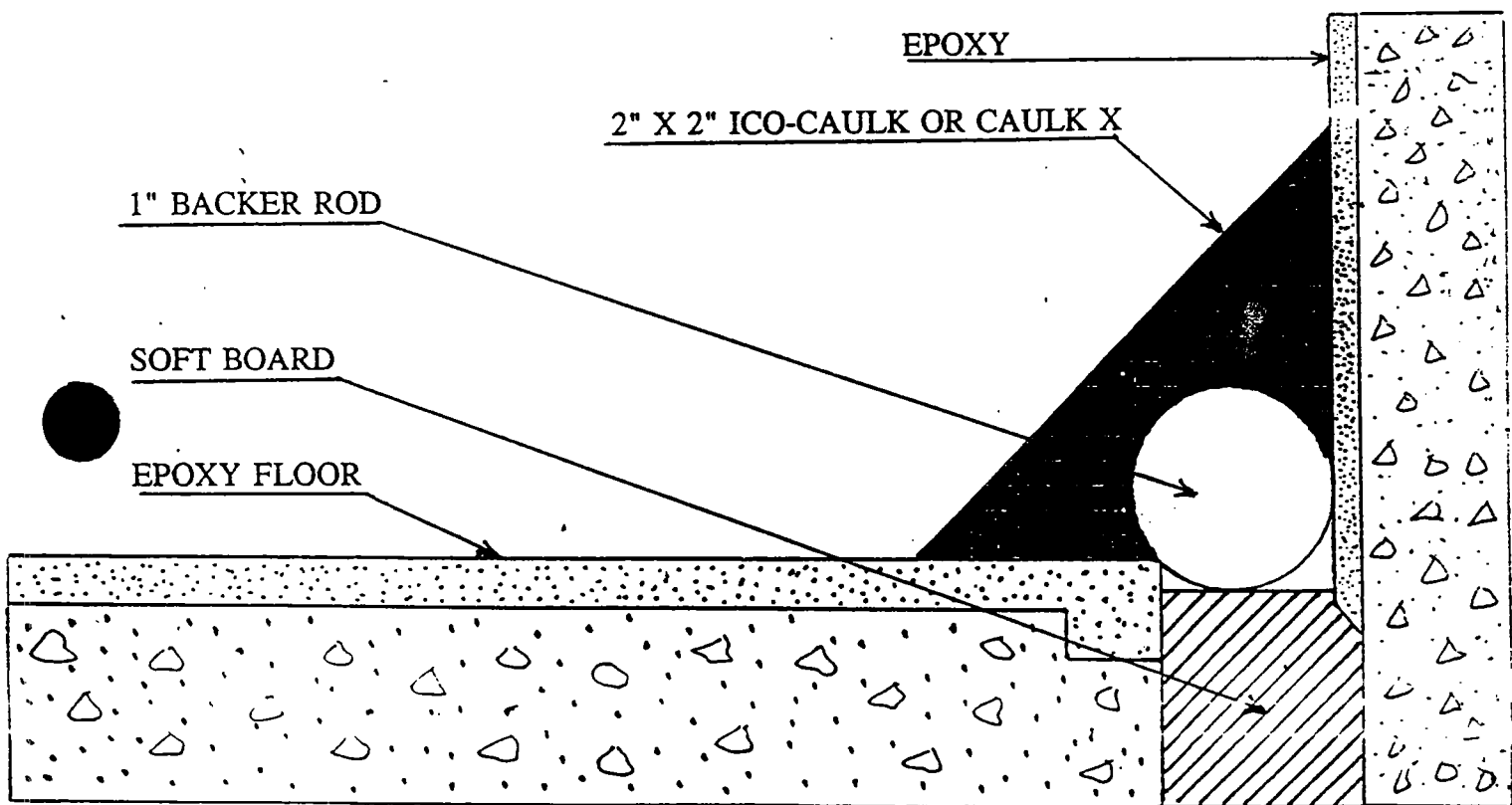
EPOXY FLOOR



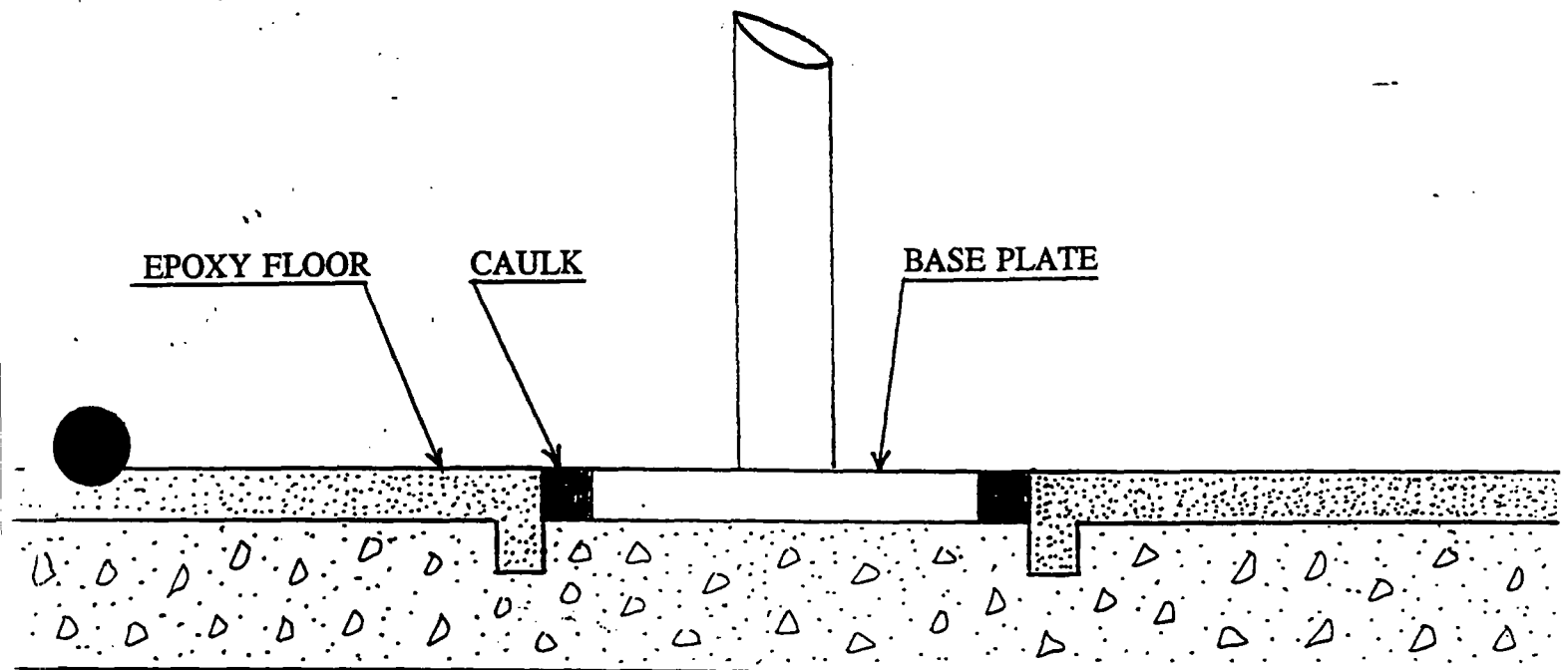
DRAWING DETAIL 4. EXPANSION JOINT



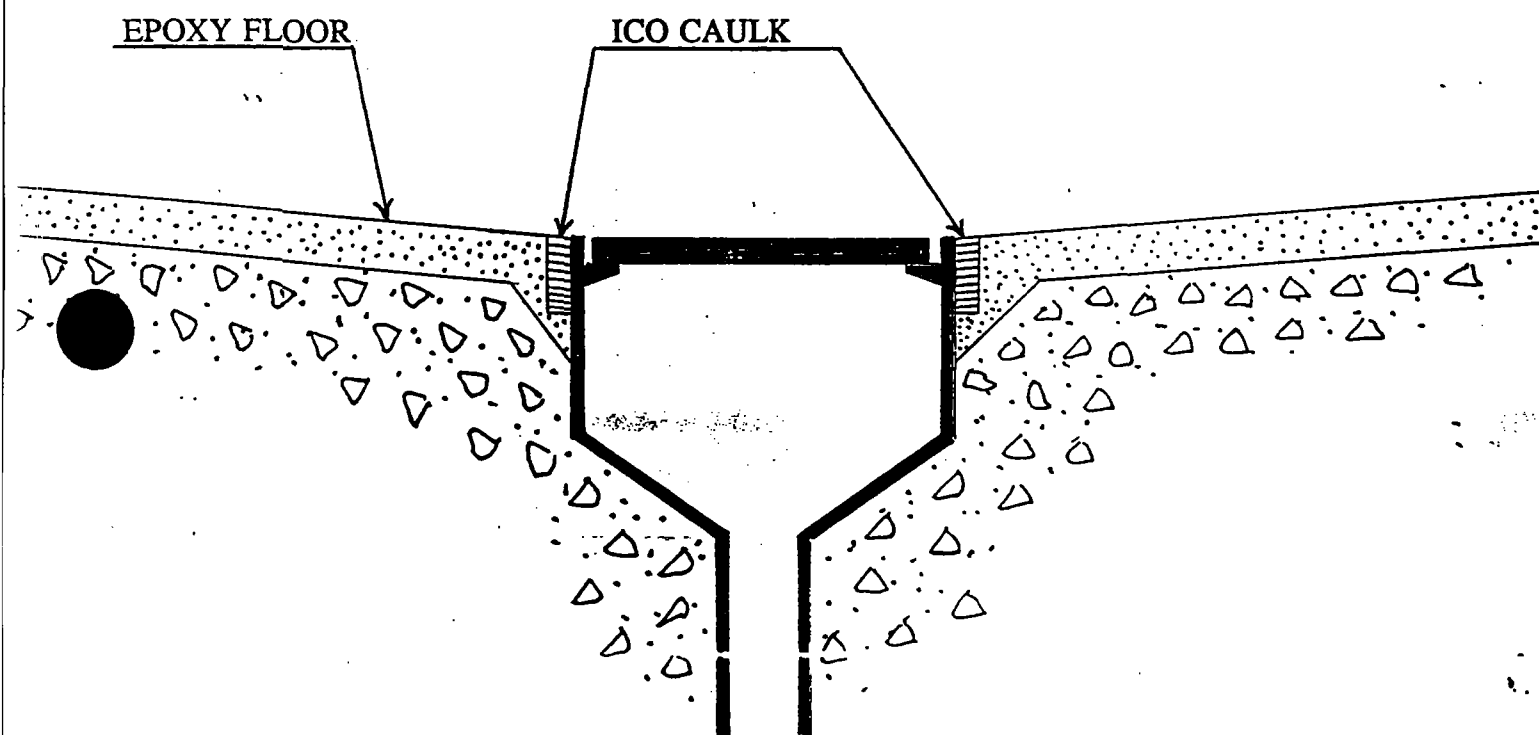
DRAWING DETAIL 5. CORNER EXPANSION JOINT



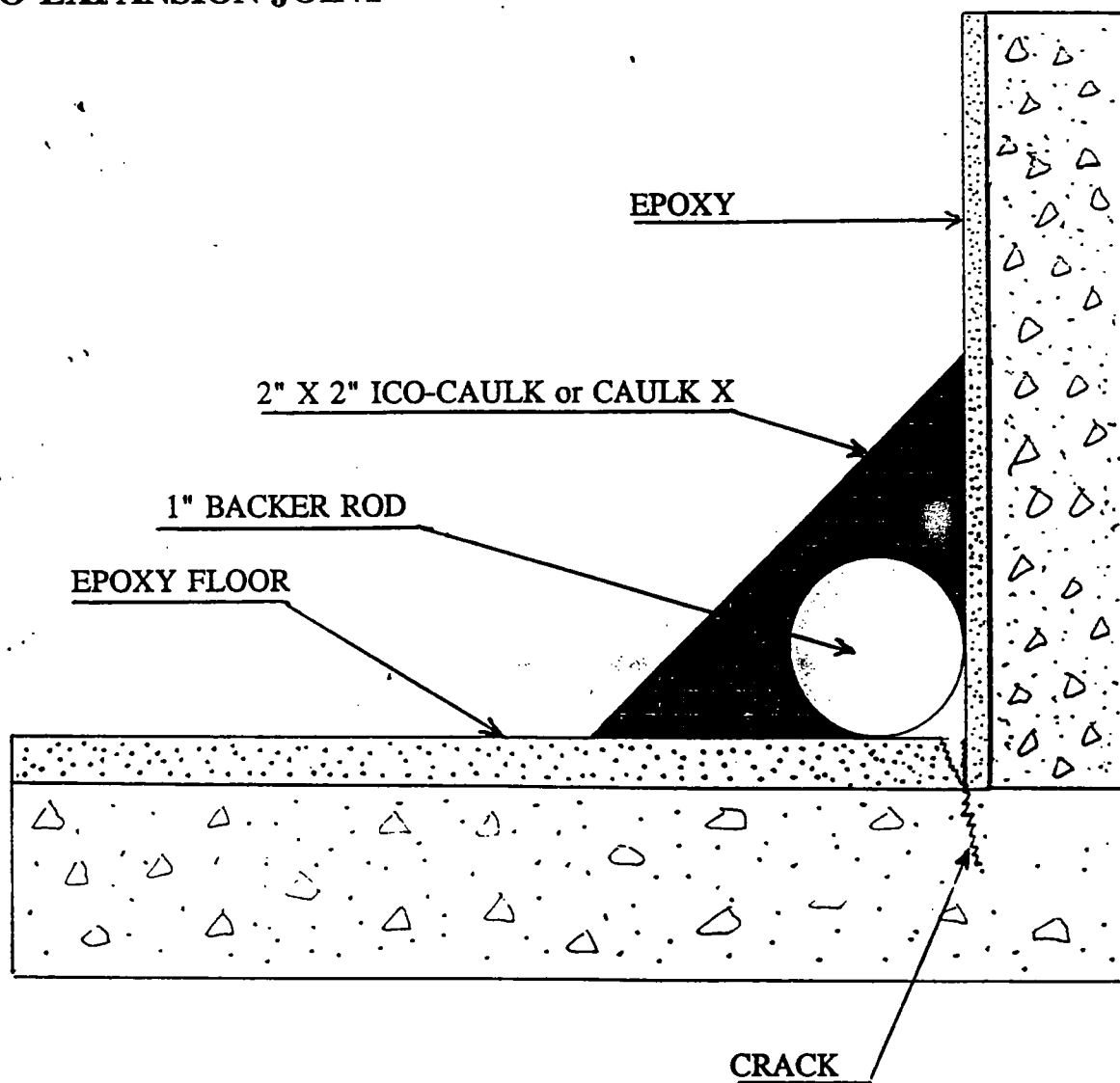
DRAWING DETAIL 6. METAL BASE PLATES



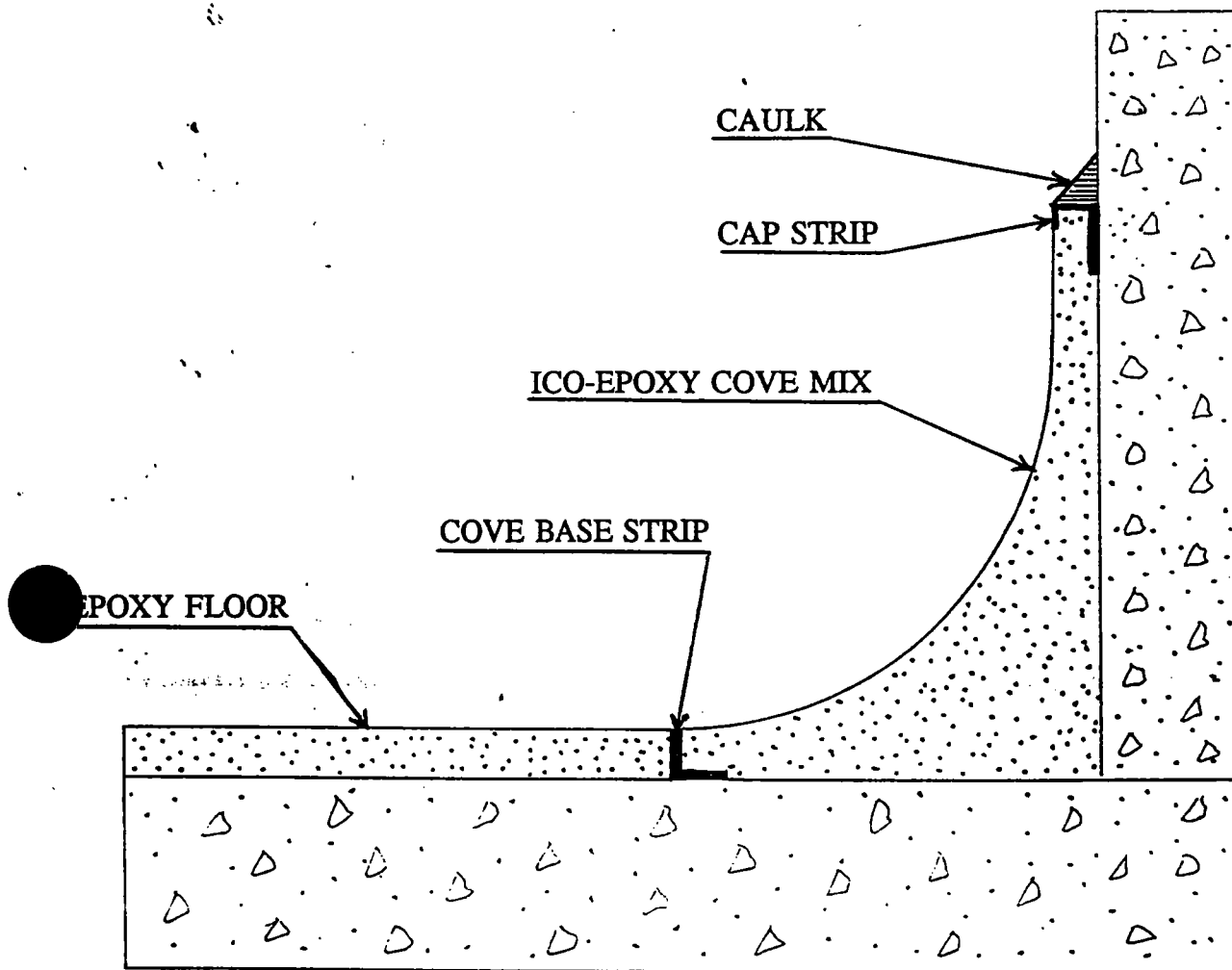
DRAWING DETAIL 7. DRAIN



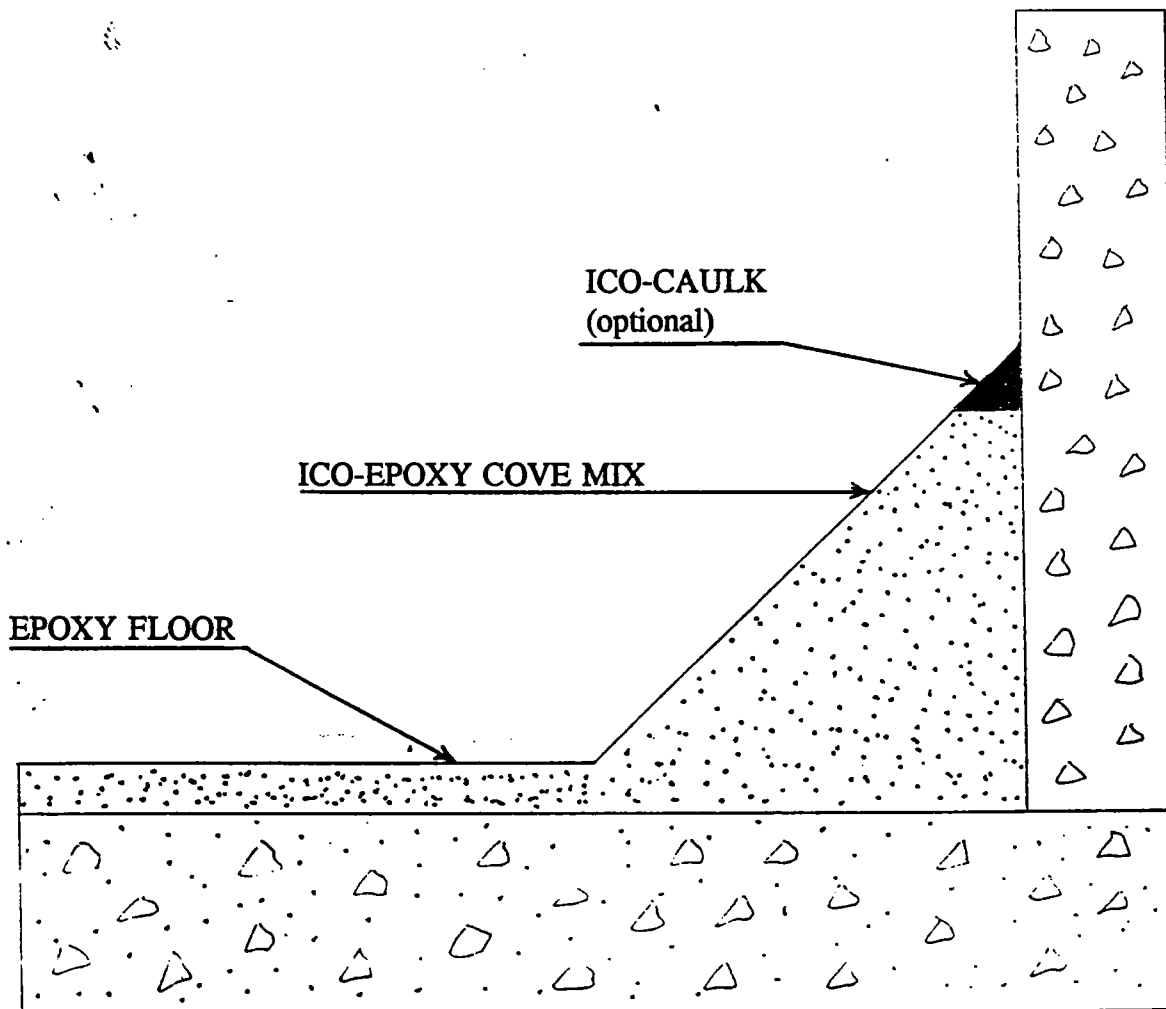
**DRAWING DETAIL 8. CORNER DETAIL
NO EXPANSION JOINT**



DRAWING DIAGRAM 9. COVE BASE



DRAWING DETAIL 10. CANT COVE BASE

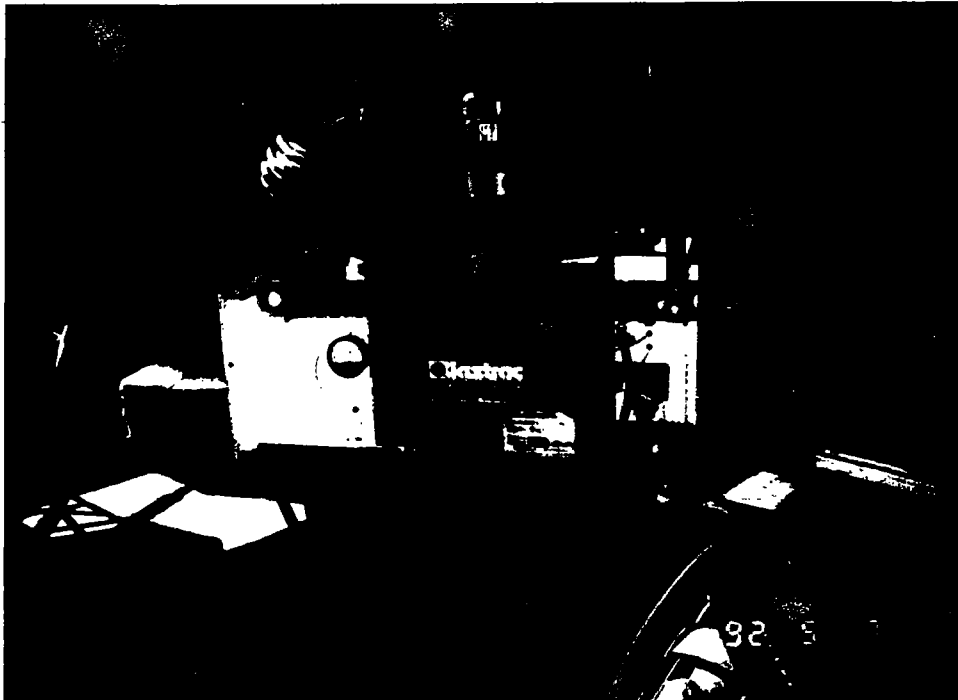


Detrex, Melrose Park, IL
ILD074424938
RCRA Container Storage Facility
35 IAC 724.275(b)

APPENDIX F

Container Storage Area Photographs

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Equipment Used During Installation



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Storage Area - Northeast Corner Looking North, Ramp @ Door Opening



Waste Storage Area - Raw Materials in Foreground

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RCRA Container Storage Facility
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Storage Facility - Facing West

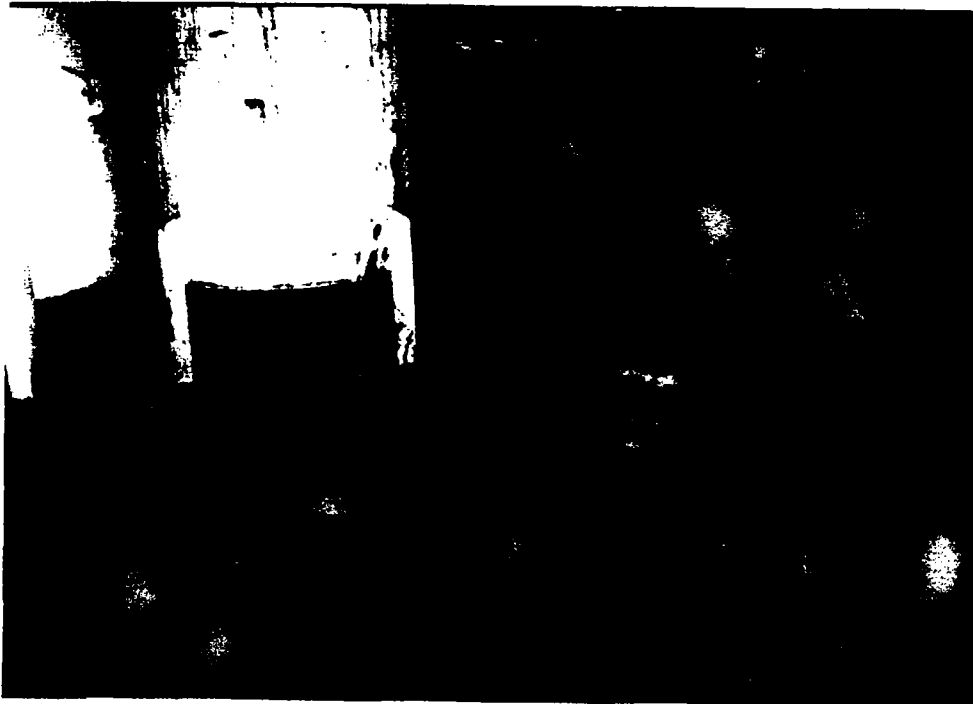


Storage Facility - Southeast Corner Facing East

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Raw Material Storage Area Adjacent to RCRA Storage - Facing West



RCRA Storage Area Facing South - Ramp For Movement of Drums

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Northeast Corner - Electrical Equipment



Facing North on West Side : Raw Material Storage

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*Section of Damged Coating Along East Wall Near Center of Storage Area
Observed During 6-5-91 Inspection*



*Repaired Section of Coating Along East Wall Near Center of Storage Area
Observed During 6-19-92 Inspection*